

Recueil factia





Traductions  
tirées de l'Ouvrage de Lambert  
à Description  
of the Genus *Cinchona*.

---

Avertissement

Les divers *espèces* de *Cinchona* dont on tire le quinquina  
du Pérou et les autres écorces de qualité semblable ont été  
jusqu'à présent fort peu connues en Europe; et même l'espèce  
principale, le *cinchona officinalis*, établie depuis si longtemps  
dans la pratique de la médecine comme un des plus précieux de-  
couverts modernes, n'a été qu'à très obscurément connue jusqu'à  
l'année 1788, où M. de Coudamine a élucidé son histoire et en  
a donné les caractères botaniques avec un suffisant degré  
de précision.

Depuis ce temps, la botanique s'est tellement enrichie.





par les découvertes des naturalistes, que l'on ne connaît pas même, aujourd'hui, de 12 espèces de Cinchona, dont plusieurs ont été très bien décrites par le professeur Vahl de Copenhague, dont j'ai donné ici la traduction, en y ajoutant les espèces découvertes depuis, et accompagnées de figures faites sur les spécimens eux-mêmes conservés dans l'herbier de Sir Joseph Banks, aide de dessin qui sont aussi en sa possession.

Par ce moyen les personnes qui résident dans les parties du Monde où l'on peut se rencontrer quelque espèce du même genre, pourront s'assurer par elles-mêmes si celles qu'elles <sup>sont à portée</sup> ~~pourront~~ de découvrir ~~et~~ sont nouvelles ou ont déjà été décrites. C'est ainsi que les plus importantes additions seront faites probablement au trésor médical que nous possédons dès à présent dans ce genre si hautement important.

---

11  
Introduction ou  
Dissertation de Vahl sur le Genre cinchona.

Le manque d'une connaissance exacte sur la plante qui  
fournit chaque médicament, n'est pas un des moindres causes  
de l'imperfection de l'histoire de la médecine, et malgré l'exten-  
sion que les connaissances ont eue dans ces derniers tems, et la facilité  
qu'il donne à ceux qui <sup>sont</sup> cultivent l'histoire naturelle, d'exa-  
miner les productions des contrées lointaines sur leur sol  
natal, nous ignorons encore de quel végétal sont tirés divers  
médicaments journellement employés dans la médecine. C'est  
à cette ignorance qu'il faut aussi rapporter l'incertitude qui règne  
sur l'activité de quelques substances particulières, et les divers  
opinions qui ont régné relativement à leurs effets sur le  
corps humain, et cela peut se dire non seulement de tels  
végétaux apportés de pays éloignés; mais aussi de ceux qui croissent  
dans notre propre pays. Nous recevons des pays chauds certains  
médicaments qui, quoiqu'ils viennent de différents lieux, reçoivent le  
même nom, et quelques plantes européennes sont, dans un endroit,  
recommandées pour leur singulière efficacité, tandis que dans un  
autre elles passent pour être absolument sans effet. Cette diffé-  
rence doit être due à ce qu'on a remarqué <sup>(dans cette dernière localité,</sup>  
des racines, feuilles, ou  
d'une plante toute différente de celle qui avoit été si estimée  
dans le premier lieu. Cette erreur est très facile à commettre, et

il arrive souvent que le nom de plante crues dans le nord de l'Europe est appliqué à quelques unes du midi qui en sont fort différentes. <sup>(Sulmunt deux)</sup> ~~pour~~ <sup>exemples;</sup> ~~Wadon~~ 1° le crues de Neuglobbe se tire cultive d'une plante très différente de la nôtre qui est l'anchusa officinalis L., et qui est très rare dans le midi de l'Europe, au contraire l'anchusa italica mentionné par Reck dans la 1<sup>re</sup> partie d. les observations (p. 12), y est très commun, ~~et~~ les habitants en font usage, et quoiqu'elle ~~ait~~ diffère beaucoup de la nôtre, beaucoup de botanistes du midi la regardent comme la même plante que celle du nord. 2°, dans le jardin d'un hôpital. Gènes, le Symphytum tuberosum est cultivé pour l'usage des apothicaires au lieu de l'officinale, qui est le vrai consolida major de la matière médicale. Si de telles fautes sont commises par ceux de qui l'on doit attendre une exacte connaissance des propriétés spécifiques des plantes, que ne devons nous pas craindre quand le soin de les ramasser est confié à des personnes peu capables de les distinguer? Il est inutile d'insister sur ce point, et suffit d'examiner les plantes que l'on apporte dans les officines des pharmaciens, pour en découvrir <sup>qui sont d'espèces très</sup> ~~de~~ <sup>différentes</sup> de celles prescrites par les médecins.

-----

Parmi les médicaments précieux qui nous viennent du Nouveau monde, le quinquina du Pérou occupant sans

sans contredit la première place. on a envain cherché à lui substituer quelque autre substance, à peine a-t-on trouvé quelque chose qui pût suppléer à son emploi. Les variations qui ont été observées, quant à ses effets, tiennent en partie à la fraude d'une qui le mélange avec des substances étrangères, et autre d'une que personne ne s'occupe de donner des caractères propres à faire distinguer la véritable d'avec la fautive.

Quelque dans ces derniers temps, on a fait des efforts infructueux pour trouver un succédané au quinquina. Ces efforts sont cependant nécessaires, puisque, d'après M. de la Bondamine, nous sommes menacés de manquer un jour de quina du Pérou, les arbres étant <sup>de longtemps</sup> presque détruits par suite d'une dévotion exorbitante. Les recueils que j'ai recueillis moi-même pendant mon séjour en Espagne, confirment ce fait que les arbres au quinquina ~~ont~~ <sup>ont</sup> disparu de lieux où il se trouvait autrefois en abondance; toutefois, la crainte de perdre cette drogue si nécessaire l'est d'acquiescer; divers botanistes ayant trouvé dans les îles occidentales plusieurs espèces du même genre, qui non seulement ressemblent <sup>à la</sup> première espèce découverte par leurs propriétés, mais qui semblent même, sous quelques rapports, la surpasser. Pendant un siècle, on a fait usage du quinquina sans connaître l'arbre qui le produit, et cette ignorance aurait continué plus longtemps, si quelques botanistes n'avaient pas trouvé

une occasion de l'examiner dans son pays natal. Le premier qui nous ait donné sur cet arbre des renseignements exacts est Lacondamine; <sup>(l'arbre est)</sup> ~~la~~ <sup>il est</sup> toujours cette inaccessibilité à d'autres, Les pays étant difficilement visités par les naturalistes. tout ce que nous en savons se borne donc à ce que Lacondamine <sup>en</sup> a rapporté, et à la figure qu'il en a donnée, quoique cette figure ne puisse pas être considérée comme parfaite. D'après mes informations nous il est certain que *Schinus* ne l'a vit jamais en nature, et qu'il s'est servi de la description et de la figure données par Lacondamine pour établir les caractères du genre. D'après le tour de Lacondamine et jusqu'à la visite de Jacquin aux îles caraïbes, on s'en connaît qu'une espèce. Jacquin en découvrit une autre qui fut regardée par *Schinus* comme douteuse, ne différant de celle du pérou que par quelques caractères peu importants. Le fruit de l'espèce caraïbe, n'était pas connu alors. Mais ayant été examinée depuis, il a été trouvé appartenir clairement au même genre. M. Forster en découvrit une 3<sup>e</sup> espèce dans les îles de Tongataboo de l'océan dans la mer du sud. une 4<sup>e</sup> espèce a été envoyée de la Martinique par M. Badier, (qui est connue sous le nom de quinquapitoun). Le professeur Martz qui a fait, il y a quelques années, un voyage aux antilles, tout en augmentant le catalogue botanique de ces îles de 850 nouvelles espèces,

malgré les voyages antérieurs de Fleming, Sloane, Jacquin et Brown, a enrichi le genre cinchona de deux nouvelles espèces, dont une a été trouvée à Hispaniola et l'autre à la Jamaïque, cette dernière cependant n'a été décrite que plus tard sur un échantillon de la collection de Joseph Banks. à toutes ces espèces, j'en puis en ajouter 3 autres, dont une ~~est~~ (était confondue) (changed) avec celle du Pérou, pour les deux autres je les regarde comme nouvelles, ~~inconnues~~, ne les ayant trouvés décrites nulle part. Le genre cinchona se trouve donc porté à 9 espèces qui toutes présentent les caractères suivants: Le tronc est celui d'un arbre; l'écorce des branches est d'un brun rouge foncé; couverte, dans quelques espèces, de poils doux vers l'extrémité; mais sur des plus grand nombre, des branches sont rondes par le bas; mais elles deviennent par le haut irrégulièrement tétraogones. celles qui portent les fleurs sont alternativement comprimées vers l'extrémité. Les feuilles sont opposées et courtement pétiolées; elles sont très entières; la surface inférieure est veinée et ~~est~~ quelque fois les nervures sont couvertes d'un poil doux. La surface supérieure est généralement nue; la substance des feuilles <sup>(un peu épaisse)</sup> est membraneuse comme celle des feuilles du café. De chaque côté, entre les feuilles, est une stipule étroitement appliquée contre la branche. Trois branches de la panicule sont toujours divisées en trois, dont la dernière porte habituellement une fleur.

Les panicules sont ordinairement placées à l'extrémité des branches et

deux des espèces ont les fleurs placées dans l'aisselle des feuilles, et une des deux en porte qu'une fleur sur un pedoncule, quand le pedoncule se divise en plusieurs ramifications, la plus forte porte deux ~~plus~~ petites bractées, et les plus petites n'en ont qu'une. Le calice est monopétale et corolliforme au dessus du ovaire, comme dans les autres plantes qui ont les feuilles opposées et stipulées. quelquefois le calice paraît seulement formé d'une marge, mais toujours divisé en 5 parties et beaucoup plus court que la corolle. La corolle est en forme d'actéomorphe, monopétale, divisée en 5 parties. Les étamines sont au nombre de 5, insérées au milieu du tube de la corolle, plus courtes ~~au-dessous même longueur~~ que le tube, ou de la même longueur que la corolle. Elles sont grêles et droites. L'ovaire est conique, soudé par le bas, avec l'extrémité pointue. Le style est filiforme et de la longueur des étamines, le stigmate est plus épais et divisé en deux. Le fruit est une capsule oblongue, s'ouvrant en deux parties, et de chaque côté de l'ouverture, il y a une cloison ~~non~~ séparée au milieu par une suture. Les semences sont comprimées et entourées d'un bord membraneux. Toutes les espèces sont indigènes natives de l'Amérique, excepté une espèce que le Dr Forster a découverte dans l'île de la Mer du Sud. Trois espèces appartiennent au continent américain; les autres sont des îles caraïbes. Elles semblent se plaire sur les

des genres les plus rapprochés des Cinchona sont les genres marattia, macrocnemum, Bellonia, portlandia et quelques autres. et eux-ci semblent ~~se~~ rattacher ~~à~~ la dernière division des Stellatées de Linné, telle que les coffea, les ixora, les parvella, à la famille des Courtoisées, avec laquelle les Cinchona sont étroitement unis par leur fruit. mais ils en diffèrent leur fruit infère et par les divisions de la corolle qui ne sont pas courbées en spirale avant leur expansion.

Voici les espèces du Genre Cinchona.

1. Cinchona officinalis. C'est l'espèce qui fournit le véritable quinquina du Pérou et qui a été la première découverte. C'est l'espèce qui a fourni le caractère du genre; c'est elle conséquemment que Linné a mentionné dans les anciennes éditions de son Systema naturae et dans la sixième édition de son Genera plantarum.

2. Cinchona pubescens, ainsi nommé à cause de l'épave parva pubescente de la face inférieure des feuilles. il croît aux mêmes lieux que le précédent. D'après la courte et incomplète description donnée par le Condamine d'un espèce de quinquina croissant sur le sommet des montagnes, et d'une apparence blanchâtre il semble qu'il soit le même que celui-ci.

3. Cinchona macrocarpa, ainsi nommé à cause



de la grandeur de son fruit comparé à celui des autres. Il  
 l'a découvert par Mutet, en grande forêt dans la province  
 de Santafe. C'est indubitablement l'espèce que Linnaeus  
 a décrite dans la 12<sup>e</sup> édition du système de ~~la~~ la  
 Nature. En comparant la description de Linnaeus avec  
 celle de la Poudamine et avec la figure donnée par celui  
 du C. officinalis, il est évident qu'il n'y a aucun rapport  
 entre elles, il est ~~certain~~ <sup>certain</sup>, au contraire, que la description  
 de Linnaeus s'accorde parfaitement avec mon Cinchona  
macrocarpa. Par là, je suis très convaincu que Mutet n'a  
 jamais envoyé en Europe ~~un~~ <sup>un</sup> échantillon de C. officinalis  
 lequel n'a jamais été trouvé à Santafe, et enfin que  
 le spécimen conservé dans la collection de Linnaeus est  
 le C. macrocarpa et non l'officinalis. Il y a quelques  
 années qu'une certaine quantité de quinquina a été  
 importée à Madrid et examinée par les médecins qui l'ont  
 déclaré égal à celui du Pérou.

4. Cinchona caribaea. Décrit par M. Wright dans  
 les transactions philosophiques.

5. Cinchona floribunda, ou quinquina piton  
 de M. Badiar.

L'écoulement d'une espèce a été trouvée d'une  
 égale efficacité contre les fièvres intermittentes. Elle  
 provoque le vomissement et est aussi purgative. plusieurs

personnes m'ont assuré que, dans les îles de l'Amérique,  
ces écorces sont préférées à cell. du Pérou. Les Espagnols  
m'ont été envoyés de l'Île de saint Croix.

6. Cinchona corymbifera Cette espèce, d'après Forster,  
ressemble beaucoup en apparence par le goût avec la  
C. officinalis du Pérou. une large description en a  
été donnée dans les nouveaux actes d'Upsal t. 3, p. 176.
7. Cinchona Brachycarpa
8. Cinchona lineata.

Les deux sont si intimement ~~unies~~ alliées au floribunda  
qu'il est difficile de trouver entre eux une distinction suffi-  
sante. C'est une raison pour m'attendre les mêmes effets  
curatifs. Cependant des expériences répétées pourront  
seules déterminer si ces diverses sortes sont égales  
à l'écorce du Pérou ou quelle est celle qui mérite en  
réalité la préférence. Il résulte, en attendant, des  
expériences qui ont été faites récemment que ces  
nouvelles espèces sont de meilleurs succédanés  
du quinquina que d'autres écorces qui ont été mises  
en usage dans ce dessein.

---

Gesne Cinchona

1. fleurs tomentueuses, Etamines incluses

1. *Cinchona officinalis*.

(Page 18). La planche ici donnée du Cinchona officinalis Lin. a paru il y a quelques années annexée à une publication intitulée De uso et abuso das Minhas agoas de Inglaterra, Londres, 1786, par Jacob de Cattero Sarmento, mais sans aucun accompagnement d'histoire ou de description: et il est assez extraordinaire comment elle est venue en ma possession. Elle paraît être fort peu connue, et n'a été citée par aucun auteur, à que-  
je pense, excepté par le Dr Pulteney, dans sa dissertation de cinchona, lequel m'a informé qu'elle lui avait été commu-  
-niquée par le Dr Hope d'Edinbourg. M. Hawkins qui vit maintenant à Dorchester, Comté de Dorset, contemporain de Sir Hans Sloane, avec lequel il a vécu pendant quelques années dans le dernier parti de Savie, a été assez obligeant pour me favoriser d'un exemplaire de cette planche, accompagné de la lettre suivante. Il m'a aussi favorisé d'un recet sur le quinquina par la Cordamium qui paraît être le même que celui publié par cet académicien dans les traductions françaises.

Lettre de M. Hawkins

Dorchester 12 8bre 1795.

J'ai reçu votre lettre et en retour je vous donne toutes les infor

- mation dont je suis capable sur le cinchona. Les échantillons  
 dont j'ai fait le dessin sont venus, ~~uniquement~~ <sup>avec une</sup>  
 grande quantité d'écorce de bois couvert d'écorce et de branches  
 pourvues de feuilles, de fleurs et de fruits, renfermés dans un  
 seau de vache ou de Boeuf. Le tout a été envoyé en protest, par  
 M. Lacoudamine, pendant son séjour au Pérou, au Dr Cromwell  
Mortimer Secrétaire correspondant de la Société royale, en  
 l'année 1740. Les spécimens étaient secs et tout crispés; mais j'les  
 ai étendus avec de l'eau tiède, dans la vue de compléter le dessin.  
 La planche a été gravée aux frais de la Société royale, mais elle a été  
 perdue depuis et n'a pu être retrouvée, comme Sir Joseph Banks me  
 l'a dit quand il était à Londres. Dans le même paquet se trouvaient  
 aussi des spécimens de la plante avec les trois feuilles sur le  
 côté de la principale tige, comme cela est représenté dans le  
 dessin (1) que vous avez eu de moi, avec la semence en forme de  
 rognon; ~~(sur laquelle)~~ <sup>laquelle plante</sup> ~~qui~~ est décrite par M. Lacoudamine dans  
 son mémoire sur le quinquina, présenté à l'Académie des  
 Sciences, et était utilisé pour guérir la fièvre intermittente avant  
 que le quinquina actuel fut connu. Je desire que ce qui précède  
 puisse vous être utile. Je suis, cher Monsieur, &c

(1) Le dessin, avec sa description, a été présenté par moi à la Société d'histoire  
 et de géographie dans le 5<sup>e</sup> volume de ses transactions.

Note. il s'agit ici du dessin du Myrsoperymum

page 30. Lettre de M. Brown.

Monsieur, ayant été informé de votre intention de publier une notice sur les différentes espèces du genre Cinchona, permettez moi de vous présenter un quinquina du pérou que je crois nouveau, ou tout au moins fort peu connu dans ce pays.

En 1792, je m'embarquai comme chirurgien sur le transport le Speedy, Capitaine Thomas Melvil. Nous devions d'abord nous rendre à la nouvelle galle du sud, puis côtoyer le Chili et le Pérou, pour la pêche de la baleine du Cachalot. Tandis que nous pêchions près des îles Gallapagos, notre équipage fut attaqué de scorbut et il nous devint nécessaire de gagner le continent. Dans ce but, le Capitaine se proposait de gagner Marota, petit village au sud de l'équateur mais les vents et le courant nous portèrent vers Técumaz, autre village indien situé à 56 milles de latitude Nord et vers le 80° degré de longitude ouest. Nous y demeurâmes 10 jours, jusqu'à ce que notre monde fut entièrement établi.

Comme la province de Quito, à laquelle Técumaz

---

(1) ceci paraît certain, lorsqu'on compare les feuilles présentées par M. Brown avec celles de toutes les espèces contenues dans l'herbier de Sir Joseph Banks. Elles ne se rapportent à aucune. un dessin très fidèle de ces feuilles est donné dans la planche XI.

apportant est reconnu pour produire du quinquina,  
 j'étais impatient de voir un arbre si justement estimé;  
 mais l'espèce communément employée en Europe croît  
 - sait plutôt dans l'intérieur du pays qu'aux lieux que  
 je pouvais visiter, et mon attention fut appelée sur une  
 nouvelle espèce qu'on me dit avoir été trouvée très officieu-  
 par les médecins du pays. Comme le maître du Navire  
 qui me donnait ces renseignements devait mettre à la voile  
 le lendemain au matin, il s'arrangea très obligeamment  
 avec un indien pour me mener voir l'arbre, et parla en  
 ma faveur au Gouverneur qui me promit de me procurer  
 une petite quantité de la meilleure sorte, promettant qu'il  
 a généralement rempli plus tard.

L'attention que je devais à nos malades m'empêcha de  
 faire beaucoup de recherches, mais d'après ce que j'ai pu voir,  
 le quinquina de tocamar paraît être tout d'une seule  
 espèce, et la qualité des écorces se mesure <sup>à l'âge</sup> ~~à l'âge~~ des  
 arbres. Les jeunes arbres de deux ans sont très estimés, leur  
 écorce étant mince, fragile, aromatique et astringente.  
 Celle des arbres <sup>plus</sup> est plus épaisse, et quand elle est sèche, elle  
 tourne au noirâtre du côté interne, et devient d'un rouge  
 noirâtre au milieu. L'extérieur est d'un rouge plus pâle à  
 l'extérieur. L'un et l'autre, quand on les expose au soleil pour  
 les faire sécher se coulent bien elles mêmes, et prennent une  
 couleur <sup>foncée</sup> ~~foncée~~ noirâtre ~~à l'extérieur~~ du côté interne. C'est inconvénient

cependant, peut être prévenu en enlevant la même pelle-  
-cule interne, au moment où l'écorce est séparée du bois,  
et en n'exposant pas trop tôt l'écorce au soleil. Elle con-  
-viendrait alors une ~~bonne~~ belle couleur cannelle, et sera  
agréable à l'œil.

Nonobstant la prédilection pour les jeunes arbres je suis porté à  
croire que leur écorce ne possède qu'une supériorité in-  
-signifiante. Leur elle des arbres âgés. Lorsqu'ils sont d'une et l'autre pulvérisés,  
elles sont si peu d'être semblables qu'il est extrêmement difficile de  
les distinguer, et sous quelque forme qu'elles soient données, elles  
sont également efficaces. un personnage de quelque importance me  
disait qu'elle était d'un dixième plus active que l'Ecorce habituellement  
vendue à Londres. comme j'avais de cette dernière au Subhan, pro-  
-venant de ~~Collège de l'apothicaire Hall~~ <sup>par la</sup> sur la qualité de laquelle  
je pourrais compter, j'en fis l'essai et de une ou deux observations.  
L'Ecorce de l'écorce diffère de celle du Collège de Londres ~~par la~~ <sup>par la</sup>  
couleur, le goût et l'efficacité; la couleur est d'un vert brunâtre,  
couvert par dessus d'une moule blanchâtre; la surface intérieure  
d'un rouge sombre tirant sur le noir. Lorsque la cath, elle paraît  
d'un rouge pâle. Elle a un goût amer très agréable, avec aroma-  
-tique, mais non aussi attrayant que le quinquina de ma caisse  
de pharmacie. quand on la fait infuser à froid ou bouillir dans  
la même quantité d'eau, la force paraît supérieure et son goût  
beaucoup plus agréable. il ne paraît pas supérieur quand on le  
travaille par l'esprit de vin, et dans le cas, il reste aisément

Dans l'estomac et l'autre non. pendant notre retour, plusieurs de nos gens ayant été atteints d'un forte fièvre, j'en choisis deux ayant les mêmes symptômes et ~~je leur~~ j'administrerai à chacun un des deux sœurs, à doses égales. celui qui prit de l'Ecorce de técamaz fut étalé une semaine avant l'autre. Dans un second essai comparatif la différence fut de 5 jours, et dans un 3<sup>e</sup> de 7 jours. je ne voudrais pas que l'on crût que j'exagère en peu de cas comme suffisante pour affirmer la supériorité de l'Ecorce de técamaz. cette décision doit être réservée à des hommes plus expérimentés et qui auront de plus nombreuses occasions de l'employer.

Tous les arbres que j'ai vus croissent sur le penchant d'une colline et dans un terrain sec et nu. La terre est rocailleuse, mêlée de petites pierres, et n'ayant pas plus d'un pied de profondeur, car plusieurs des racines paraissent à la surface, et ce plus que j'en examinai, n'étaient pas couvertes de plus de 2 pouces de terre. Aucun de ces arbres ne portait de fleurs ni de fruits, au mois d'avril et je n'en pus m'en procurer à técamaz, les habitants attribuant tant peu de prix à ces diverses parties; ~~et~~ ils sont très étonnés qu'on s'en occupe. quant à l'arbre ils l'~~estiment~~ <sup>valent</sup> ~~très~~ y attachent plus de prix, et ne le montrent qu'avec difficulté. Si ce n'est là l'Amérindien de la personne dont j'ai parlé, il est probable que je serais parti sans l'avoir vu.

Aucun des arbres que j'ai vus n'excédait 2 pieds de circonférence et ne s'élevait à plus de 24 pieds. Le mode employé par les indiens pour dépouiller l'arbre de son écorce consistait à faire des



des incisions longitudinales ~~du même caractère~~ à la distance de 2 pouces  
sur une longueur de 2 pieds. on <sup>lie</sup> ~~enroule~~ les bandes d'Ecorce en  
bottes de 32 livres chacune, et on les maintient en cet état pendant  
un jour ou deux, afin d'empêcher qu'elles ne se coulent trop par  
elles mêmes par la chaleur. cependant l'Ecorce ainsi préparée a le  
désavantage de prendre une couleur de fer, et de <sup>être</sup> ~~devenir~~ pas aussi belle  
à l'œil que celle qui est <sup>exposée</sup> ~~exposée~~ au soleil, ~~on~~ <sup>est</sup> ~~retournée~~ régulièrement  
et bien séchée. Elle ne doit pas, en effet, être trop serrée pendant  
la dessiccation et elle doit être parfaitement cassante et se comprime  
en deux parties.

Pour transporter l'Ecorce d'un lieu dans un autre, on la renferme dans  
des enveloppes de cuir. Lorsque le cuir est humide, l'Ecorce est  
sujette à moisir; mais elle y attache peu d'importance, parce qu'en  
l'exposant au soleil, la moisissure disparaît facilement, et qu'elle  
suppose que les propriétés n'en sont pas altérées. ~~MM~~ Cette écorce  
se vend à Genesquivel 1 lb. 3 pence la livre, <sup>lorsque</sup> ~~tandis que~~ la quinquina  
ordinaire s'y vend 1 Schilling.

L'Ecorce de Pérou est employée dans toutes les maladies où la  
quinquina ordinaire du Pérou est reconnue utile; mais on suppose  
qu'elle possède une efficacité particulière pour remédier aux indigestions  
aux faiblesses d'estomac et pour établir une constitution débile. On  
dit aussi qu'elle est très efficace pour prévenir la gangrène, et fort utile  
contre les pertes hémorrhoidales, les écoulements, &c.

La manière d'administrer l'Ecorce de Pérou est très variée.  
Comme l'estomac la supporte aisément, on peut l'administrer

Sous la forme qui paraît la plus agréable au Chirurgien distingué m'a  
 été que la meilleure manière d'Employer étoit en infusion faite à  
 froid. il versoit ordinairement 16 onces d'Eau froide sur une once  
 d'Ecorce pulvérisée grossièrement et la laissoit macérer pendant 4  
 heures. quelquefois, il la faisoit <sup>couler</sup> bouillir légèrement sur un feu doux  
 pendant 10 minutes, et après avoir exprimé, ajoutoit à la Liqueur 2  
 onces d'Alcool. il donnoit ce mélange 3 cuillerées à bouche dans  
 l'occasion. mais le plus souvent il se contentoit d'une infusion faite à  
 froid, et après avoir ajouté la même quantité d'Alcool, il administroit  
 le médicament ainsi qu'il vient d'être dit.

Telles sont, Monsieur, <sup>mes</sup> observations sur ce nouveau quinquina.  
 si, tout imparfaites qu'elles sont, elles attirent l'attention d'hommes  
 plus capables de traiter ce sujet et mieux placés pour en constater  
 les effets, mon but en vous envoyant cet ouvrage sous son importance  
 sera pleinement rempli.

D. Brown.

P.S. J'ai oublié de dire que mon arrivée à Lisbonne j'eus informé  
 que le quinquina jaune étoit en grande réputation ~~et~~, il me vint  
 à l'esprit que la nouvelle écorce pouvoit être de la même espèce et  
 je la montrai à M. Baker, chirurgien anglais, qui la communiqua  
 aux premiers médecins de Lisbonne. tous ont trouvé que c'étoit  
 une espèce très distincte et qu'ils n'avoient jamais vue. Ils ne  
 croyoient pas qu'elle eût déjà été apportée en Europe.  
 L'écorce au Santal vient pareillement en abondance à l'écarne,

et se trouve sur le même terrain que le quinquina, sa cendre est employée par les espagnols pour parfumer leurs appartements et pour en enduire les églises. Les indiens aussi emploient les feuilles, on les ~~saute~~<sup>broyait</sup> entre les mains et les appliquant sur les tempes, comme un remède certain contre le ~~mauvais~~ mal de tête, après avoir trop bu. Le Boldo est employé de la même manière et dans le même but. ~~Il est~~ que cet arbre-Santal (1) soit le même que celui dont la résine est si estimée comme encens dans les Indes orientales, ou qu'il soit une espèce distincte, c'est ce que je n'ai pas pu décider, n'étant pas allé visiter dans la Botanique.

page 39. Les vertus de genre Cinchona sont si bien décrites dans l'excellent ouvrage du Dr Woodville, intitulé 'Medical Botany' que je prends la liberté de copier son récit, presque sans altération. Le voici :

Il semble que nous ne sachions pas encore d'une manière sûre, ni en quel temps et de quelle façon l'efficacité médicinale du quinquina, qui est aujourd'hui si bien établie, a été découverte. quelques ans auparavant que son usage contre la fièvre intermittente était connu des péruviens longtemps avant la conquête de leur pays par les espagnols,

(1) cet arbre est d'une espèce différente de celui des Indes orientales (Saxum myrsifolium), comme il le paraît par un échantillon de bois rapporté par M. Brown et qui est maintenant en ma possession. Ce bois abonde en résine et quand on le brise, il répand une odeur semblable à celle de la résine jaune - Botany - Bay.

mais qu'ils en avaient dérobé la connaissance aux Européens. D'autres, au contraire, affirment que les péruviens ne <sup>supposaient pas</sup> ~~supposaient pas~~ que le quinquina fut propre à l'usage médical, <sup>qu'ils</sup> ~~ils~~ pensaient que la grande quantité exportée de leur pays était destinée à la teinture, et qu'ils ont même tenté quelques essais dans cette voie (Ulloa, voyage dans l'Amérique mérid. t. 2, p. 271). La Condamine dit que, suivant une ancienne tradition, les américains ont dû la découverte de ce remède aux liors (ou Puma, felis discolor L.), que l'on prétend être sujette à une sorte de fièvre dont ils se guérissent en mangeant instinctivement l'écorce des cinchona. Mais Geoffroy établit que la propriété curative du quinquina a été connue dans les circonstances suivantes : — quelques <sup>(arbres au quinquina)</sup> ~~quelques~~ cinchona ayant été muris par vent d'un étang, personnellement goûter de cette eau, à cause de son amertume insupportable. Cependant un habitant des environs, saisi d'un violent accès de fièvre, et ne trouvant pas d'autre eau pour étancher une soif ardente, but abondamment de celle de l'étang et fut guéri, ayant obtenu un résultat aussi heureux, il conseilla à ceux qui avaient la fièvre de se faire la même médecine, ce qui réussit également bien (Mat. méd. t. 2, p. 78). L'usage de cet excellent remède cependant, resta presque inconnu jusqu'en l'année 1638, <sup>par</sup> ~~par~~ une consigne produite avec cette écorce, par la fraternelle compagnie del Obischo, femme du vicaire du Pérou, à Lima, on repandit l'emploi, et fut cause qu'on la connaît pendant un temps, sous le nom de Poudre de la Compagnie. À son retour en Europe, cette dame remit une grande quantité de cette poudre aux Jésuites, dans les mains desquels elle acquit encore un plus grande réputation, et qui, par la suite, l'introduisirent directement eux-mêmes, en Europe; ce qui leur fit donner le nom de Poudre ~~de~~ d'Ecore ou de poudre des jésuites et celui de poudre du cardinal de Lugo, parce que par les soins de ce prélat, on en distribuait gratis de grandes quantités aux religieux et aux pauvres de Rome (Geoffr. mat. méd. 11, p. 315).

« Cette écorce nous est apportée en morceaux de différentes grandeurs, dont les uns sont roulés en tubes courts et <sup>épais</sup> ~~minces~~ et les autres plates. Le côté extérieur est bruni et généralement couvert en partie par des masses blanchâtres. Le côté interne est d'une rouge-jambrée ou couleur de sang. La meilleure sorte est celle compacte et assise, et la moins friable sous les dents d'épice inférieure et d'une texture ligneuse quand on la brise, et se sépare en fibres quand on la mâche. La première se pulvérise plus aisément que la dernière, et paraît quand elle est pulvérisée d'un brun clair, ressemblant à la cannelle ou un peu plus pâle. Elle a une odeur faible approchant de celle de la moëlle, avec quelque chose d'aromatique qui n'est pas désagréable. Elle a un goût considérablement amer, atténué <sup>très</sup> persistant dans la bouche et accompagné d'un peu de chaleur aromatique, non suffisant pour la rendre désagréable. » (Lewis Mat. méd. p. 485).

Outre ce quinquina, plusieurs autres ~~sortes~~ d'écorces produites par d'autres espèces de Cinchona sont recommandées pour l'usage médical, ~~celles~~ <sup>différentes</sup> notamment, spécialement le cortex peruvianus ruber ou quinquina rouge, tel <sup>sont</sup> ~~est~~ celui du Cinchona caribaea ou quinquina jamaïque, celle du Cinchona floribunda produite à Sainte Lucie, et celles de 2 ou 3 autres espèces découvertes à Santa Fé. La première de ces sortes est en morceaux plus larges et plus épais qu'elle, commun. Plusieurs des morceaux sont concaves mais non roulés ~~sur~~ sur eux mêmes comme le quinquina en tubes. Elle est tout <sup>entière</sup> comme le meilleur quinquina commun et paraît évidemment composée de 3 couches. L'extérieure est mince, rugueuse, fréquemment couverte de moëlle, et d'une couleur rouge-brun. Celle du milieu est plus épaisse, plus compacte et d'une couleur plus sombre; elle est <sup>très</sup> fragile et résineuse. La couche la plus interne est plus ligneuse et fibreuse et d'un rouge plus vif. Quand on pulvérise l'écorce, la couche moyenne qui paraît contenir ~~le plus~~

La plus grande proportion de matière résineuse, on la laisse pos brayer aussi facilement que le sulfate; ~~Il faut~~ ~~la que~~ Il faut faire attention à cette circonstance après que la partie la plus active de l'écorce ne soit laissée au-dessus de la poudre. Le quinquina rouge présente au goût tous les caractères particuliers du quinquina d'un ~~usage ordinaire~~, mais il est beaucoup plus doux que la sorte officielle commune. Son infusion faite à l'eau froide est beaucoup plus amère que la plus forte d'action du quinquina commun. Son astringence est, à égale quantité, plus grande que celle de l'infusion de quinquina commun, ainsi que cela est montré par une addition de vitriol martial. La teinture spirituelle du qq. rouge est aussi proportionnellement plus forte que celle du qq. blanc. La quantité de matière extraite par l'alcool rectifié de la poudre de qq. rouge a été à celle retirée de l'autre, comme 3 <sup>(315 : 2)</sup> est à 2 dans une expérience et comme 229 est à 130 dans une autre. et cependant en faisant infuser les 2 résidus de la 1<sup>re</sup> expérience dans l'eau bouillante, celui du quinquina rouge a donné une liqueur considérablement plus amère et qui est devenue au noir par le vitriol martial, tandis que la liqueur produite par l'autre était presque sans goût et privée d'astringence (Lewin. loc. cit.).

Quant aux propriétés médicinales, nous avons plusieurs autorités respectables qui nous montrent que le quinquina rouge possède les mêmes vertus que le qq. commun, dans un degré bien plus élevé (Fleming et Skeels), et qu'il a été très souvent employé avec succès dans la cure de la fièvre intermittente. De là on pense que c'est celui qui, depuis Arrêt, les Espagnols ont nommé cascailla colorada (quinquina rouge), qui est probablement la ~~sorte originaire~~ <sup>la même</sup> apportée originairement en Europe, et qui a ~~premier~~ <sup>été</sup> ~~employé~~ dans les mains de Sydenham, de Morton et de Lister, aussi bien il résulte du témoignage des plus vives praticiens que le quinquina <sup>d'abord</sup> ~~anciennement~~ employé était d'une couleur plus foncée que le quinquina commun d'aujourd'hui (Baker, Méd. trad. vol. III, p. 161).

(Observations sur l'efficacité supérieure du quinquina rouge),

Le Dr Saunders s'était imaginé d'abord que le quinquina rouge était l'écorce  
du tronc des arbres parvenus à toute leur croissance, et que les branches, & les  
arbres fourniraient le quinquina-pâle ou commun. mais il parait avoir  
abandonné cette opinion dans la 3<sup>e</sup> édition de cet ouvrage, où il dit qu'il  
a récemment vu un excellent quinquina rouge, apporté d'Espagne par des  
marchands, dont la plus grande partie était en tubes aussi petits que le  
quinquina commun roulé, &c. ce quinquina était extrêmement tendre &  
n'était autre chose évidemment que les tiges du grand quinquina  
rouge <sup>cauté</sup> dans lequel on a enlevé le bois et le cœur de la même cañe. Si les quinquina  
pâle et rouge <sup>étaient</sup> ~~étaient~~ <sup>produits par</sup> en réalité le ~~produit~~ <sup>produit</sup> de la même espèce, cinchona  
la dernière diffère seulement de 1<sup>re</sup> par une plus grande matéité, ~~par~~  
l'indurité de la couleur du quinquina pâle. Ils coïncident avec l'épaisseur ou  
la grandeur des morceaux, à qui n'a point.

Le cinchona caribaea a été décrit et figuré par Jacquin et par le Dr  
Wright, il croît à la Jamaïque où il est commun. Hôte du bord de la mer.  
Selon le Dr Wright, l'écorce de cet arbre n'est pas moins efficace que celle  
des cinchona d'après, dont il peut être mélangé. Succédané, mais il  
moins atteignant, selon le Dr Meete. Le Cinchona floribunda ou  
quinquina de Sainte-Lucie, dont on trouve en figure dans les herbiers  
philosophiques & dans les observations <sup>(sur la)</sup> ~~de~~ <sup>Physique de Reiser</sup>, fournit un  
écorce que l'on dit avoir été employé avec avantage, mais malgré  
tout ce qui a été écrit pour établir son caractère médical, elle nous  
semble être bien inférieure aux autres espèces du genre. Dans son  
état récent elle est fortement cristalline et cathartique et elle  
retient ~~sa~~ partie ~~de~~ ces propriétés quand elle est desséchée; si bien que  
l'homme ne peut en supporter de fortes doses et qu'en petite quantité  
même, les effets ne sont pas tels qu'on puisse le donner seul.

13/  
recommandation particulière. Plusieurs espèces de quinquina ont  
dernièrement été découvertes à Santa Fé, produisant des écorces d'une  
sorte pâle et rouge, qui d'après leurs qualités semblent pouvoir être  
également propres à partager l'usage médical avec celles du Perou.  
(Voyez le Mémoire de Zedler).

Pour le présent, l'usage du quinquina est principalement réservé  
aux quinquinas pâle et rouge, et plus le premier ressemble au  
second, plus il est estimé.

a Le quinquina du Perou communique ses propriétés à l'Eau froide  
comme à l'Eau bouillante; mais la décoction est plus étirée, plus  
sûre et forme d'œuvre plus soudainement avec le fer. L'infusion  
néanmoins, contient comme plus de matière extractive, dans un état de  
solution plus parfaite, et la couleur, après l'addition du fer, devient plus  
noire, tandis que celle de la décoction reste plus faible, quand elles sont  
un peu vieilles, l'addition du fer les rend vides, et dans ces cas on trouve  
qu'elles sont dans un certain état de fermentation. Les acides carboniques  
ou caustiques, ou la chaux, précipitent la matière extractive, et quand  
on se sert d'acide caustique, on excite d'acide rougeâtre le précipité.  
L'Eau de chaux précipite moins abondamment l'infusion que la  
décoction récente, et dans la dernière précipité on découvre quelque chose  
de terreux ~~de terreux~~ <sup>Grisivellier</sup> doux au toucher. avec toutes les infusions et réduites  
au même état que la décoction, et alors leurs précipités contiennent  
presque une égale quantité de terre douce et de matière extractive.  
Ainsi, l'Eau de chaux, tout aussi bien que le fer, peut servir d'épreuve  
pour la force et l'état de conservation des différentes préparations et  
des différents sorts de quinquina. ~~Par leur moyen~~ <sup>Comparative</sup> Par leur moyen, les infusions  
à froid ont été trouvées moins altérables que les décoctions et les infusions  
ou décoctions du quinquina rouge, moins altérables que celles du



quinquina pûb; cependant, par la longue, elle précipite avec l'Eau de Chaux, plus de terre douce et plus de matière extractive. L'Eau de chaux comme précipitant la matière extractive, paraît être incommensurable aux impropres que détruisible. L'Eau pure a peu de pouvoir tenir l'alkali en suspension ~~pour~~ à l'aide de beaucoup moins de gomme qu'on le suppose. L'Espirit de vin rectifié ~~comme~~ extrait encore de l'amertume, mais non de l'âcreté du quinquina dont le résidu provenant de 20 affusions d'Eau froide; et l'Eau extract de l'âcreté du quinquina et non de l'amertume dont le résidu d'un grand nombre de traitements par l'alcool de l'acide qui a subi l'action des deux menstrues est insipide (Lewis).

D'un grand nombre d'expériences faites sur le quinquina péron, par le Docteur Irving, publiées en 1783, <sup>il</sup> résulte que le pouvoir <sup>(compasité)</sup> excréteur de l'alkali écorce par différents menstrues les range dans l'ordre suivant: Espirit Dulcifié de vitriol, Cellaire caustique, Eau de vin de France, vin du Rhin, Eau tiède, vinagre et eau, Espirit de vitriol dulcifié, alkali volatil doux, Espirit de vin rectifié, alkali végétal doux, Eau de Chaux. Le pouvoir antiseptique du vinagre et du quinquina ~~se~~ seules ensemble est double de leur somme prise séparément. Le pouvoir âcreté du quinquina est augmenté par l'alkali vitriolique ~~et~~ qui détruit son premier goût amer.

quoique le quinquina, lors de la première introduction et même depuis, ait été repoussé par d'innombrables médecins comme remède dangereux, aujourd'hui toutes les craintes sont effacées, et son caractère médicinal est universellement établi. De sorte que les simples précautions qui subsistent encore sont restreintes à son mode d'opérer et à la manière la plus efficace d'administrer.

\* D'après une Dissertation sur le quinquina par le Docteur L. M. de la Roche, Médecin en 1783.

Le quinquina a d'abord acquis sa réputation pour la cure de la fièvre intermittente et dans ces cas, quand il est convenablement administré, il manque rarement son effet. Dans ce but, quelques médecins préfèrent le donner juste avant l'accès, d'autres durant l'accès et d'autres immédiatement après. Le Dr Cullen, qui est de la première opinion dit: j'en suis persuadé que la meilleure pratique est de donner une forte dose de quinquina immédiatement avant le tiers du accès, ~~mais~~ et ~~comme~~ cette dose doit pas être moindre que 2 gros de quinquina râpé; mais ~~comme~~ y a des hommes qui ne peuvent pas supporter cette quantité, ou une plus forte. Si on la juge nécessaire, il convient alors de donner de moindres doses que l'on réitère d'heure en heure, à partir de quelques heures avant l'accès (Cullen trad. franç. II. p. 113)

Les vertus du Buchou macrocarpa ont été dernièrement décrites par le Dr Clarke, dans son traité de la fièvre jaune, où l'on trouve une table comparative de la quantité de matière soluble ou extractive obtenue par l'eau et l'esprit de vin des différentes espèces de quinquina.











*A Present, From the Author*

*To Dr. Fraser Junr.*

*Home Square Chelsea.*  
*June 20<sup>th</sup> 1851*

5314

---

A  
DESCRIPTION  
OF THE  
GENUS CINCHONA.

---



*Mr. Lambart,*

*to the care of*

*Dr. Fraser*

*Home Square*

*Chelsea*

*June 20<sup>th</sup>*





5314 (2)  
*Lambert* (A.B.)

A

DESCRIPTION

OF THE

GENUS CINCHONA,

COMPREHENDING

THE VARIOUS SPECIES OF VEGETABLES FROM WHICH  
THE PERUVIAN AND OTHER BARKS OF A  
SIMILAR QUALITY ARE TAKEN.

ILLUSTRATED BY

FIGURES OF ALL THE SPECIES HITHERTO DISCOVERED.

TO WHICH IS PREFIXED

PROFESSOR VAHL'S DISSERTATION ON THIS GENUS,

READ BEFORE THE SOCIETY OF NATURAL HISTORY AT COPENHAGEN.

---

ALSO

A DESCRIPTION, ACCOMPANIED BY FIGURES, OF A NEW GENUS

NAMED

HYÆNANCHE: OR, HYÆNA POISON.

---

L O N D O N :

PRINTED FOR B. AND J. WHITE, AT HORACE'S HEAD, FLEET-STREET.

M.DCC.XCVII.



*J. Grisbourn*



TO THE  
LINNÆAN SOCIETY OF LONDON,

AND TO

SIR JOSEPH BANKS, BART.

*KNIGHT OF THE MOST HONOURABLE ORDER OF THE BATH,*

AND

*PRESIDENT OF THE ROYAL SOCIETY,*

BY WHOSE LIBERAL AND FRIENDLY COMMUNICATIONS,

ACCOMPANIED BY

ORIGINAL DRAWINGS AND SPECIMENS FROM HIS HERBARIUM,

THIS WORK HAS BEEN SO AMPLY ENRICHED,

IT IS NOW INSCRIBED, WITH THE GREATEST RESPECT,

BY

AYLMER BOURKE LAMBERT,

*FELLOW OF THE ROYAL AND ANTIQUARIAN SOCIETIES, ETC.*

*VICE-PRESIDENT OF THE LINNÆAN SOCIETY.*



---

## PREFATORY ADVERTISEMENT.

---

THE several species of the genus *Cinchona*, from which the Peruvian and other Barks of a similar quality are taken, have been hitherto but little known to the Botanists of Europe; and even the principal species, the *Cinchona Officinalis*, so long established in the practice of Physic as one of the happiest of modern discoveries, was but obscurely known till about the year 1738, when Monf. Condamine elucidated its History,

and gave its Botanical Characters with the necessary degree of precision.

Since that period so greatly has the science of Botany been enriched by the discoveries of Naturalists, that no less than twelve species of *Cinchona* are now found to exist. Of these, some of the principal have been excellently described by Professor Vahl of Copenhagen, of whose Dissertation on the subject we here give a translation; with the addition of other species since discovered; accompanied by figures taken from the specimens themselves, preserved in the Herbarium of Sir Joseph Banks, and assisted by drawings in his possession.

By this means persons residing in those parts of the world in which any species of the genus

nus may occur, will be enabled to ascertain, whether what they have discovered be new, or already described; and thus the most interesting additions may probably be made to the medical treasures we at present possess in this highly important genus.



IN the course of printing this work, some few inaccuracies have escaped the Author's observation :—it is necessary to remark the following :

Page 13. l. 3, from bottom, for a *Mr. Wright*, read *Dr. Wright*. From this gentleman, who is lately returned to the West Indies, many more valuable discoveries in Botany may be expected.

Page 30. l. 5, from bottom, for 46 read 56.

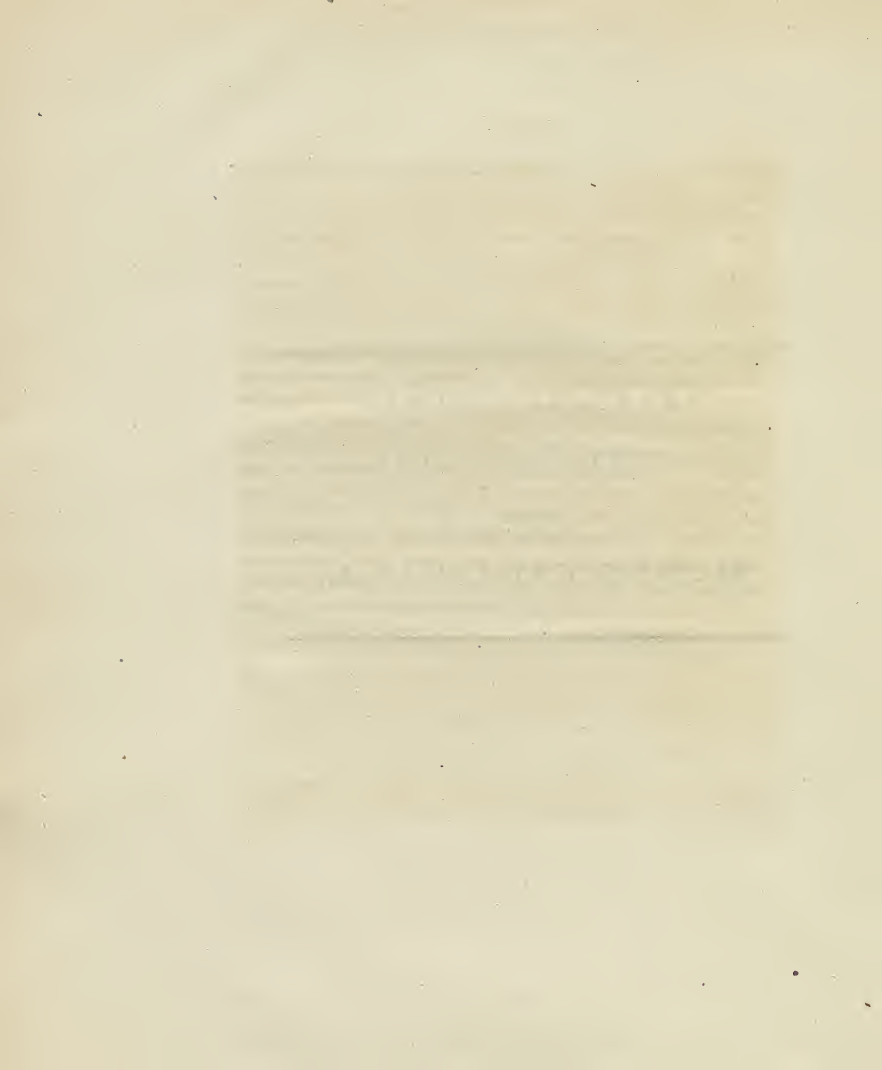
Page 38. l. 15, for *Beavais* read *Beauvois*.

In page 39. l. 19. after the word *lions*, add the following note :  
“ Meaning the *Puma*, sometimes called the American lion—a very different species from the common lion.”

---

PROFESSOR <sup>Martin</sup> VAHL'S  
DISSERTATION  
ON THE  
GENUS CINCHONA.

---



---

THE want of an exact knowledge from what plant this or that particular medicine is taken, is not one of the least causes of the present imperfection of the History of Physic; and notwithstanding the extensiveness of commerce in these latter times, and the opportunities thereby afforded to the cultivators of Natural History of examining the productions of various countries in their native soil, and even in regions from whence self-interest had before excluded them, we are still ignorant from whence several medicines are prepared, which we every day use in the practice of Physic. To this ignorance must likewise be attributed that uncertainty which prevails in the operations of particular medicines, and the different opinions which have prevailed relative to their effects on the human body; and this relates not only to such vegetables as are brought from distant regions, but even to those which are natives of our own country. From the hotter climates we receive several medicines, which, though coming from different places, are called by the same title; and many European plants are in one place commended for their singular efficacy,

A

while

while in another they are found to be quite ineffectual ; which difference has been owing to having gathered roots, leaves, &c. of a very different plant from the real one so highly esteemed in some particular spot. This error is the easier to commit, as it often happens that the names of plants growing in the northern parts of Europe are often given to several of those of the south, though the plants themselves are very different, not having been properly collated. As a proof of this I will adduce only two instances : The *Radix Buglossi* in Italy is taken from a very different plant from our own (which is the *Anchusa officinalis*), a plant which I have found in but few places of the south of Europe, and which is in general rare. On the contrary, the species mentioned by Professor Retzius in the first fasciculus of his *Observations*, p. 12, under the name of *Anchusa Italica*, is there full as common as the *A. officinalis* with us, and is accordingly there made use of ; and though it differs very much from ours, yet it is considered by most of the botanists of the south of Europe as the same plant with the above northern one, which they have never seen, and of course know not how to distinguish. In the garden of an hospital at Genoa, the *Symphytum tuberosum* was cultivated for the use of the apothecaries instead of the officinale, which is the true *Consolida major* of the *Materia Medica*.

I pass over many similar examples of different plants being considered as the same in different places, even though

though much more dissimilar than the abovementioned. But if such mistakes are committed by those from whom a solid and exact knowledge of the proper distinctions of plants might be expected, what may we not apprehend to be the case, when the gathering of them is committed to the care of persons still less able to distinguish such productions? Their knowledge of plants consists in accidental distinctions, and is often confined to their being accustomed to find them in some particular place or other; a circumstance which is often capable of giving two different plants a similar aspect. As this happens every day, it is unnecessary to insist upon it. We need only search the heaps which are brought to the apothecaries' shops, in order to discover plants of very different species from those prescribed by physicians. How greatly would the knowledge of medicine be confirmed, and how many excellent remedies, grounded on the experience of all ages, would be in our possession, if our ancestors had handed down to us as sure characteristics of the plants they made use of, as the praises of their qualities! Our *Materia Medica* would not then have been filled with a number of useless articles; and the conjectures of latter ages about the medicines recommended by the ancients would have been spared, while the knowledge of efficacious medicines would have been rendered permanent and certain for the benefit of mankind. After the lapse of centuries, mankind have employed all their industry to find out the plants mentioned by Dioscorides and others of the ancients, and at length have discovered

that the pursuit was to no purpose. They were obliged to leave the plants of the ancients, and their virtues, in the same degree of obscurity in which they were involved, and to begin *de novo* the experiments on their medical qualities. All that was gained by their search was, that of about five hundred plants mentioned by Dioscorides, there were hardly twenty known to a certainty, and of them only such as can be considered as culinary or dietetic plants. The multitude of useless and uncertain remedies with which the apothecaries' shops were filled, and of which, even in our times, we have not been able to rid them, is to be charged to those examinations, and proved the only consequence of their labours. We need only mention Hellebore as a proof of this. The variety of opinions among the ancients, relative to the plant to which Sneezewort belongs, which is so highly commended by the ancients, added to the stores of medicinal shops no less than ten sorts of roots, some entirely useless, and others very different in quality from that of the ancients, which is yet not certainly known. But why should we not exculpate both the ancients and their expositors, who lived in very different climates? Botany, in their time, had not been reduced to the form of a science; it is our own age that has given it order and certainty. But notwithstanding this advantage over the ancients, and the opportunity afforded us of examining many of the remedies which the vegetable kingdom affords, even in their native climates, yet we are still in a state of uncertainty with respect to many which are in frequent use, as to  
the

the class or family to which they ought to be referred, and with respect to some we are entirely ignorant. Much light, however, has of late years been thrown on this subject, and we have learnt to a certainty the plants from which various medicines are procured; having infallible marks or characters by which to distinguish their affinities: our experience therefore will not be lost to posterity as that of the ancients has been to us, but will remain as long as the plants themselves. No one will deny that the knowledge of plants, grounded on their essential parts, which are constant and obvious, is the surest method of preserving the knowledge of their qualities, when once discovered, from perishing, as well as of determining any doubts or disputes relative to that point. The sight is unquestionably less liable to uncertainty than the smell and taste, which are capable of being perverted by several accidents in such a manner as to give uncertain indications; and how many plants are there, which, though similar in smell and taste, are yet very different in their effects! To this may be added the impossibility of explaining by words these sensations to others: it is surely far easier to inform people through the medium of sight. It may still be objected, perhaps, that colour, a particular afforded by our sight, is still an uncertain character, and is known to vary. Had we no other characters but the internal ones by which we might communicate to posterity the knowledge of those remedies from which we have received so much advantage, they would become both uncertain, and in a little time as unprofitable to them

as



as those of the ancients are to us; they would soon be commuted for others; our experiments would be laughed at, and posterity would lose the benefit of our discoveries. These are not new truths, but such as are well known, and have often been demonstrated by others; yet they are important, as they serve to evince the uses of botanical science. A certain and exact knowledge of plants from which medicines are taken, is still more necessary with respect to such plants as are not cultivated, but grow wild. By frequent gathering, these plants are liable to be too much diminished, so as not to afford a sufficient supply when requisite, and even to be quite extirpated from the places in which they were first collected. If then we did not know the plant from which such a medicine was prepared, we should not be capable of ascertaining by search, whether nature might not have produced it in other spots; and if we were not able to find it, we must either be without the desired remedy or specific against particular diseases, or else even wish to have it less known, on account of its small quantity. The loss would be the more felt, as the discoveries of ages might perhaps scarcely exhibit any thing that would so completely answer our purposes. An extensive knowledge of the vegetable kingdom, acquaintance with the natural affinities of plants, would perhaps be the only means of leading to the discovery, and on such an occasion might compensate for what we had lost; since, if we wish to find a remedy that most nearly approaches to any particular one, it can scarcely be looked for amongst such as Nature has set

at a wide distance from it. The nearer the several parts of plants approach to each other in point of resemblance, there is so much the greater reason for supposing a similarity of their virtues. He who understands nature will hardly doubt of this : daily experience furnishes proofs of it, not only amongst the vegetable tribes, but also in the other kingdoms of nature, and this in proportion to the natural affinities.

The genus of plants which I have now the honour to propose to the Society, increased by the descriptions of some of the less known species, will serve as a further proof of what has been advanced.

Among the many excellent medicines which have reached our knowledge since the discovery of the New World, the Peruvian Bark deserves undoubtedly the first place. It has been tried in vain to find a substitute for it, scarcely any thing having been yet discovered which might supersede its use. The obstacles which it met with before it was universally adopted, and the different opinions relative to its effects, are sufficiently known. As they do not belong to my scope, it is superfluous to treat of them : the cause of the difference in the experiments made with the Peruvian Bark must be ascribed in part to the frauds which are practised in mixing it with other ingredients of similar colour and taste, though very different in operation, and perhaps even of a contrary nature and of a pernicious effect. Men, while anxious in sup-  
port

port of their own opinions, did not endeavour to discover the true source of these variations : it was long before the distinctive characters, by which the genuine was to be distinguished from the spurious, were attended to. If a more accurate knowledge of the trees the bark of which thus increased the quantity had not been wanting, or if the tree from which the true bark was taken had been known, we should have been, at least in part, better able to judge in the matter. Attempts have been made, even till the present time, to discover some other remedies which might supply its place, but without success : this enquiry is so much the more necessary, since, according to Mons. Condamine's account, published more than half a century ago in the *Mem. de l'Academie des Sciences*, for the year 1738, p. 324 (edit. Amsterdam), we may some time or other be necessitated to lose the Peruvian Bark ; the trees being at that time so much diminished in Peru by frequent decortication, that it was apprehended that in future even a small quantity could scarce be obtained from them. Later experience has shewn that this opinion was not entirely void of foundation. The accounts which I have been enabled to collect during my residence in Spain, all agree in affirming that the tree is nearly extinct in those places where it was formerly found in the greatest abundance : yet, though it has not been discovered in any other region, our fear is vanished as to our one day losing so necessary a drug. Various botanists, who in these latter times have travelled in the West Indies to investigate the natural productions of that part of the world, have found  
several

several species of this genus, which not only resemble the first discovered species as to their qualities, but which even seem, in some respects, to surpass it.

The Peruvian Bark was made use of during a whole century, without its being known from what tree it was taken; and this ignorance would have still continued, had not some botanists obtained an opportunity of seeing it in its native country. The first whom we have to thank for certain and authentic information concerning the genus, is Monsr. Condamine. It continued, however, almost inaccessible to us after that time, its native country not being easily visited by naturalists. Few botanists have seen it, and all that we know of it is confined to what Monsr. Condamine has related. The various figures we are in possession of are all borrowed from him, though his representation cannot be esteemed a perfect one, and has the appearance of being in some points a little artificial. From what I shall proceed to mention, it will be evident that Linnæus never saw it, but availed himself of Condamine's description and figure to establish the characters of the genus. From the time of Condamine to that of Jacquin's visit to the Caribbee Islands, only one species was known. Jacquin discovered another, which was regarded by Linnæus as dubious, differing in some inconsiderable points from the Peruvian species. The fruit of the Caribbean species was not at that time known; but having since been examined, it clearly belongs to the same genus. Mr. Forster discovered a third

B

species

species in the islands of Tongataboo and Eaoree in the South Sea. A fourth was sent from Martinique by Mons. Badier, which is known by the name of *Quinquina Piton*. Profeſſor Swartz, who ſome years ago made a voyage to the Antilles, beſides increaſing the vegetable catalogue of thoſe parts with eight hundred and fifty new ſpecies, notwithſtanding the prior viſits of thoſe indefatigable botaniſts Plumier, Sloane, Jacquin, and Brown, enriched the genus *Cinchona* with two new ſpecies, of which one was found in Hiſpaniola, and the other in Jamaica; which latter, however, he deſcribed from a ſpecimen in Sir Joſeph Banks's collection. As an addition to all theſe, I have the honour to exhibit three more, of which one is changed with the Peruvian, and the two others I look upon as unknown, not having been able to find them any where deſcribed. The genus is conſequently increaſed to nine ſpecies. All the ſpecies which conſtitute this genus agree in the following circumſtances, viz. The trunk is a tree: the bark of the branches is of a dark brown-red colour, in ſome ſpecies covered with ſoft hairs towards the extremities, but in moſt ſpecies without: at the bottom theſe branches are round, and frequently of a whitish grey, but at the top they become imperceptibly tetragonous: thoſe which bear flowers are diſtinguiſhed from the others by being alternately compreſſed to the top: the leaves are oppoſite; infered to the branch by a ſhort pedicle; their edges are ſmooth, or entire, without any denticulations; their lower ſurface is ſomewhat more venous, and ſometimes the oblique fibres are covered with ſoft hair; the

upper surface is generally without hair : the substance of the leaves is somewhat membranaceous, and bears a resemblance to that of coffee-leaves : at both sides, betwixt the leaves, is a stipule, which is closely adpressed to the branch : the peduncles sit commonly at the top of the branches of the umbel, these branches being always divided into three, of which the last bears one flower only. Two species have the flowers sitting in the angle formed by the leaves with the branches, and of these one species has only one flower on the peduncle. Where the peduncle is divided into more ramifications, there are two small bractææ at the larger, and one at the smaller. The calyx is one-leafed, above the germen, corolliform, in the same manner as in plants that have opposite leaves and stipules. Sometimes the calyx is only a kind of margin, but always divided into five small points, and much shorter than the corol : the corol is funnel-form, monopetalous, divided into five parts ; the stamina five, inserted at the middle of the interior part of the tube, being either shorter than the tube, or of equal length with the corol ; they are slender and erect : the germen is conical, and bent down, with a pointed tip ; the style is thread-form, of the length of the stamina ; the stigma thicker, and somewhat bipartite : the fruit is an oblong capsule, opening in two parts. From both corners of each part there is a dissepiment separated in the middle with a crevice : the seeds are compressed, and surrounded with a membranaceous margin. All the species are natives of the New World, one excepted, which was discovered by

Dr. Forster in the South Sea islands. In the other parts of the world there has as yet been no species discovered. Three species only are found on the continent of America, and the rest in the Caribbean islands: they seem to prefer mountainous situations.

The genera most allied to *Cinchona* are *Manettia*, *Rondeletia*, *Macrocnemum*, *Bellonia*, *Portlandia*, and some others; and these seem to connect the last division of the *Stellatæ* of Linnaeus, such as *Coffea*, *Ixora*, *Pavetta*, with the family of *Contortæ*, to which *Cinchona*, as to the fruit, is nearly related; but it differs in having the corol not being contorted into a spiral before their expansion.

The species of this genus are as follows:

1. *Cinchona officinalis*. This is the species from which is taken the genuine Peruvian Bark, and is that which was first discovered: it is the species which has given the character of the genus, and is consequently that which Linnaeus mentions in the old editions of his *Systema Naturæ*, and in the 6th edition of his *Genera Plantarum*.

2. *Cinchona pubescens*. So named from the pubescent appearance on the backs of the leaves: its native place the same as the foregoing. From the short and incomplete description



description given by Condamine of a species of *Cinchona* growing on the summits of mountains, and of a whitish appearance, it should seem to be this.

3. *C. macrocarpa*. So named from the superior size of the fruit in comparison to that of the others. This is the species discovered by Mutis in large woods in Santa Fé in America : it is undoubtedly this species which Linnæus describes in the twelfth edition of the *Système Naturæ*. On comparing Linnæus's description with that of Condamine, and the figure given by him of *C. officinalis*, it is evident that it by no means agrees with it; but on the contrary it perfectly accords with my own of the *C. macrocarpa* : and of this I am the more convinced, as Mutis never sent specimens into Europe of the *C. officinalis*, it being never found at Santa Fé ; and lastly, that the specimen preserved in the Linnæan collection is *C. macrocarpa*, and not *officinalis* : its bark is white, and rather more bitter than that of the *officinalis*. Some years ago a quantity of it was imported to Madrid, and was tried by several physicians, who all agreed in declaring it equal to the Peruvian.

4. *C. Caribæa*. Described in the Philosophical Transactions by a Mr. Wright.

5. *C. floribunda*, or *Quinquina Piton* of Mons. Badier. The bark of these two species is found of equal efficacy in inter-



intermittents. They promote a tendency to vomition, and are also purgative. Several persons in England have assured me that these are preferred in the West India islands to the Peruvian. Both these species were sent me from St. Croix.

6. *C. corymbifera*. This, according to Forster, has the greatest resemblance in appearance and taste to the officinalis or Peruvian : a description at large is given of it in the Nov. Act. Upf. tom. 3. p. 176.

7. *C. brachycarpa*, and

8. *C. lineata*,

Are both so nearly allied to *C. floribunda*, that it is difficult to find sufficient distinctions between them, and there is reason to expect the same effect from them as from the others. Nothing but repeated experiments can determine whether the several kinds are equal to the Peruvian, or which may in reality deserve the preference; but from the experiments which have already been made, it clearly appears that they are far better substitutes than any other Barks which have been occasionally made use of for that purpose.



*Cinchona officinalis.*

J. Barlow sculp.

CINCHONA,

So named from the Countess del Cinchon, Lady of a Spanish Viceroy, whose cure is said first to have brought the Peruvian Bark into reputation.

Lin. Gen. p. 228. Reich. No. 245. Schreb. 301. Gærtn. t. 33. Juss. 201.

Quinquina Condarn. Aët. Gall. 1738.

CHARACTER ESSENTIALIS.

Capfula (infera) bilocularis, bipartibilis; valvulis diffipimentis parallelis interne dehifcentibus.—Swartz. in Aët. Holm. 1787, p. 119.

CHARACTER NATURALIS.

Cal. Perianthium monophyllum, fuperum, breve, perfiftens, quinquedentatum: dentibus acutis.

Corolla monopetala, infundibuliformis, quinquefida. Tubo longo, obfcure angulato: laciniis lanceolatis vel linearibus, tubum æquantibus.

Stam. Filamenta quinque in medio tubi.

Antheræ lineares, erectæ.

Piftil.

Pistil. Germen inferum, turbinatum, obscure angulatum. Stylus longitudine staminum.

Stigma crassum, bifidum vel integrum.

Per. Capfula calyce coronata, bipartibilis, intus medio dehiscens, dissepimento parallelo.

Semina plura, oblonga, compressa, ala membranacea cincta.

#### HABITUS GENERIS.

Caulis arboreus. Rami teretes, superne obscure tetragoni; floriferi alternatim compressi.

Folia opposita, indivisa, integerrima. Stipulae foliis interpositae, ramis adpressae. Inflorescentia in plerisque paniculata, brachiata, pedunculis trifidis.

#### SPECIES.

Floribus tomentosis, staminibus inclusis.

C. officinalis—Cinchona foliis ovato-lanceolatis, glabris, capfulis oblongis. Tab. 1.

Quinquina Condam. in Act. Parif. 1738, cum tab.

Cinchona officinalis. Lin. S. V. ed. 10. p. 929. Spec. Plant.



Plant. p. 244. Vahl. Act. Soc. Hist. Nat. Havn. fasc. 1. p. 17. tab. 1. Vahl. Symbol. Botan. fasc. 3. p. 37. Miller Dict. ed. a Martyn, vol. 1. Diff. Med. Inaug. de Cinchona off. Lin. per Ricar. Pulteney, cum fig. Reich. 1. 476. Gärtn. Fruct. 1. 169. Swartz. Obfer. 72. Commers Noric. 1744, p. 217. t. 1. f. 3. Plenck. Ic. t. 131. Wood. Med. Bot. 546. t. 200. Lamark. Encycl. pl. 164. f. 1. Lin. Mat. Med. N° 71. Quinquina Geoffr. Mat. Med. tom. 2. p. 180. Alston. Ind. Med. Tripl.—Cortex Peruvianus, Peruanus, China Chinæ, Quinquina officin. Dalei Pharm. ed. 3. p. 291. Lewis Mat. Med. p. 427. China Chinæ, Hoffman Suppl. 11. par. 2. Mat. Med. p. 166. Vogel Hist. Mat. Med. p. 287. Arbor febrifuga Peruviana Raii Hist. Plant. tom. 2. p. 1796.

Habitat in Loxa Peruviæ.

Cin. off. Rami cortice fusco-purpurefcentes, sæpe e rimis tranfverfis obliquis scabri, cicatrifati post casum foliorum.

Folia petiolata, ad apices ramorum approximata, in ramis floriferis remota, patentiffima, bipollicaria, ovata vel ovato-lanceolata, acuta, lævia, utrinque glabra, fupra subavenia, oblique nervofa, nervis inferioribus oppofitis; fubtus paulo pallidiora, venofa.

Petoli femipollicares, fupra canaliculati, fubtus convexi, verfus bafin rugofò-scabri.

C

Stipulæ

Stipulæ utrinque binæ, minutæ, acutæ.

Panicula terminalis, patens, trichotoma. Pedunculi et pedicelli leviter tomentosi : Pedicelli uniflori.

Bractea minuta ad basin et in medio pedicelli.

Calyx margo superus, quinquedentatus : dentibus brevissimis.

Corolla vix unguicularis, extus tomentosa : laciniis acutis, intus lanatis, tubo brevioribus.

Filamenta tubo breviora. Antheræ longitudine tubi.

Germen tomentosum. Stigma apice incrassatum subbifidum.

Capfula oblonga, glabra, semipollicaris, lineis obscuris elevatis.

The plate here given of the *Cinchona officinalis* Lin. appeared some years ago annexed to a publication entitled *De uso e abuso das Minhas agoas de Inglaterra*, Londres, 1756, by Jacob de Castro Sarmiento—but without its history, or any account of it : and it is somewhat extraordinary how it came into the publisher's possession. It seems to be very little known, and has not been  
quoted

quoted by any author, I believe, except Dr. Pulteney, in his *Diff. de Cinchona*, and who informed me that his figure was communicated to him by Dr. Hope of Edinburgh.—Mr. Hawkins, now living at Dorchester, Dorset, a contemporary of Sir Hans Sloane, and with whom he lived for some time in the latter part of his life, was so obliging as to favour me with an impression of this plate, accompanied with the following letter. He also favoured me with an account of the *Cinchona* by Condamine, and which seems the same already published by Condamine himself in the French Transactions.

MR. HAWKINS'S LETTER.

Dorchester, Oct. 12, 1795.

DEAR SIR,

I RECEIVED the favour of yours, and in return shall give you all the information I am able concerning the *Cinchona*. The specimens which I made the drawing from came inclosed in a large quantity of the bark, several pieces of wood with the bark on, and branches of the leaves in flower and seed, packed up in a cow or ox-hide, as a present from Monf. Condamine (then residing in Peru) to Dr. Cromwell Mortimer, Corresponding Secretary to the Royal Society in the year 1740. The specimens were in a dried crumpled state, which I expanded by means of warm water, in order to complete the drawing. The plate was engraved at the expence of the Royal

C 2

Society,

Society, has been since lost, and cannot be found, as Sir Joseph Banks told me when in London.—Also were included in the same parcel specimens of the plant with the three leaves along-side of the main stalk, as represented in the drawing \* you had before of me with the kidney-shape seed, and which is described by Monf. Condamine in the Memoirs of the Academy of Sciences in his account there of the Jesuits Bark ; which was first used for curing intermittents before the present was known. I wish the above may prove of use to you.

I am, Dear Sir,

Your most obedient, humble Servant,

J. HAWKINS.

\* The drawing, with its description, was by me presented to the Linnaean Society, and will appear in the 3d vol. of their Transactions.





*Cinchona pubescens.*

CINCHONA PUBESCENS, PL. 2.

Cinchona foliis ovatis basi elongatis, subtus pubescentibus, capsulis cylindricis. Vahl. in Act. Havn. 1. 1. p. 19. t. 2. Mill. Dict. Mart.

Habitat in Peru. Amiciffimo viro cel. Dn. Jussæo hanc debeo.

Rami superne pubescentes.

Folia petiolata, spithamæa, palmam lata, obtusa, basin parum per petiolum decurrentia, tenera, venosa, subtus nervis pubescentia.

Petiolus bipollicaris, pubescens, subtus convexus.

Panicula terminalis, brachiata, pubescens. Pedunculi partiales biftrifidi : Pedicellis brevissimis unifloris. Bractæ minutæ ad basin pedicellorum.

Calyx margo superus, quinquedentatus : dentibus minutis, ovatis, acutis,

Corolla præcedentis. Tubus medio incrassatus.

Stamina & Pistillum ut in C. officinali.

Capsula cylindrica pollicaris, utrinque parum angustata.

CINCHONA MACROCARPA, PL. 3.

*Cinchona* foliis oblongis subtus pubescentibus costatis.

*Cinchona* officinalis. Lin. S. V. ed. 12. p. 164. descriptio.

*Cinchona* officinalis foliis ellipticis subtus pubescentibus, corollæ limbo lanato. Lin. Suppl. p. 144. S. V. edit. 14. p. 213. Vahl. in Act. Havn. 1. 1. p. 19. t. 2. Mill. Dict. Mart.

Habitat in regno Santa Fé. Dedit. Dn. Ortega.

Rami articulati, crassitie pennæ cygnæ, villosi-tomentosi.

Folia petiolata, plusquam palmaria, oblonga, juniora elliptica subcoriacea, supra nitida, glabra, subtus pubescentia, costata : costis villosi-tomentosis. Juniora supra pilosa, præsertim secundum nervos.

Petiolus pollicaris, supra planus, subtus convexus.

Stipulæ lanceolatae, deciduæ, petiolo longiores, basi connatae, intus glabræ.

Panicula



*Cinchona macrocarpa* ?



Panícula terminalis, trichotoma, pubescens.

Pedunculi compressi triflori sesquipollicares.

Flores subsessiles.

Braætea lineari-lanceolata utrinque ad divifuras pedunculi univerfalis, pollicaris, & alia fubulata ad bafin finguli floris, parva.

Calyx campanulatus, pubescens, intus fericeus, quinque-dentatus, rarius fexdentatus: dentibus obfoletis, acutis.

Corolla coriacea, sesquipollicaris, pilis minutis adpreffis tomentofa. Limbi lacinia lanceolata, obtufa, longitudine tubi.

Filamenta breviffima. Antheræ lineares, faucem parum fuperantes.

Germen pentagonum. Stigma bifidum.

Capfula cylindrica, bipollicaris, glabra, bafi parum anguftior. Valvula diffepimenti bafi apiceque finu magis hiantes.

CIN-

## CINCHONA CARIBÆA, PL. 4.

\*\* Corollis glabris, staminibus exsertis.

*Cinchona pedunculis axillaribus unifloris.*

*Cinchona caribæa.* Lin. Spec. 245. Syft. 214. Reich. 477. Jacqu. Amer. 61. t. 169. t. 95. Piët. 35. t. 63. Obf. 2. 27. t. 47. Vahl. in Act. Havn. 1. 1. p. 21. Swartz. Obf. 72. Gärtn. Fruët. 1. 169. Pluk. Phyt. t. 103. f. 3. Plenck. Ic. t. 132. Vit. Sum. Pl. vol. 1. p. 461.—Mill. Dict. Mart. Murr. App. Medic. vol. 1. p. 339.

*Cinchona jamaicensis, feu caribbeana.* Wright in Philos. Transf. vol. 67. p. 504. 506. t. 10.

Habitat in Caribæis.

Rami inferne teretes, cortice cinereo; superne subcompressi, fusco-purpurascens, punctis cinereis adspersi.

Folia petiolata, sesquipollicaria, ovata, acuminata, integerrima, glabra, venosa.

Petiolus vix semiungularis.

Stipulæ parvæ, acuminatæ, latiores quam longæ, ciliatæ.

Pedunculi





*Cinchona caribaea?*



*Cinchona corymbifera?*



Pedunculi axillares, solitarii, oppositi, longitudine petioli.

Calyx margo quinquedentatus: dentibus minutis.

Corolla bipollicaris, glabra. Laciniae limbi lineares, longitudine tubi.

Stamina longitudine corollae.

Stylus longitudine staminum. Stigma incrassatum, indivisum.

Capſula oblonga, glabra, laevis:

# CINCHONA CORYMBIFERA, PL. 5.

Cinchona foliis oblongo-lanceolatis, corymbis axillari-  
bus. Lin. Syst. 214. Suppl. 144. Forster in Nov. Act.  
Upf. 3. 175. Flor. Austral. N. 88. Vahl. in Act. Havn. 1. 1.  
p. 22. Mill. Dict. Mart. Vit. Sum. Plant. vol. 1. p. 461.

Habitat in Insulis Tongatabu & Eaove Maris Pacifici.

Folia petiolata, palmaria, acuminata, integerrima, glabra, saturate viridia, nervo subtus purpureo.

Petiolus vix uncialis.

Stipulae membranaceae, acutae.

D

Pedunculi

Pedunculi solitarii, axillares, apice compressiusculi, longitudine foliorum.

Corymbus trichotomus, magnus. Forst. l. c.

CINCHONA LINEATA, PL. 6.

Cinchona panicula terminali, foliis ovatis acuminatis glabris. Capfulis pentagonis. Vahl. in Act. Havn. 1. p. 22. t. 4. Mill. Dict. Mart.

Habitat in St. Dominica.

Rami inferne teretes, cortice cinereo ; superne purpurascens.

Folia brevissime petiolata, sesquipollicaria, ovata, acuminata, minime nitida, obtusiuscula, supra secundum nervos lineata.

Stipulae ovatae, acutae.

Panicula terminalis, trichotoma : Pedunculi compressi, triflori.

Bractea setacea ad basin pedicellorum.

Calycis dentes setacei, longitudine germinis.

Corolla & Stamina ut in infequente.

Germen pentagonum.



*Cinchona lineata* V.



7

*Cinchona floribunda*

Differt a *C. floribunda* foliis minime nitidis, basi rotundatis, minoribus, supra lineatis. Panícula parva: laciniis calycis fetaceis longitudine germinis. Capfulis lineis quinque elevatis, nec lævibus.

CINCHONA FLORIBUNDA, PL. 7.

*Cinchona* panícula terminali, capfulis turbinatis lævibus, foliis ellipticis acuminatis. Swartz. Prod. 41. Vahl. in Act. Havn. 1. 23. Philos. Transf. vol. 74. p. 452—456. t. 19.

*C. montana*. Magaz. Bot. 6. 96. t. 3.

Kinkina Piton. Act. Nat. Cur. 1787. Rozier Journ. de Phys. 1781. p. 169—179. and 1789, p. 129—132. t. 1. Mill. Dict. Mart. Murr. App. Medic. vol. 1. p. 941.

Habitat in St. Lucia, Martinica, Hispaniola.

Tota glaberrima.

Rami inferne teretes, superne obscure tetragoni, purpurascetes.

Folia Coffeæ arabicæ petiolata, sæpe spithamæa, patentissima, lanceolato-elliptica supra lævia, nitida, medio sulco exarata, subtus pallidiora, venosa, nervosa: nervis obliquis parum elevatis.

Petiolus semipollicaris, subtus convexus.



Stipulae oblongae, obtusae, vaginantes.

Panícula terminalis, brachiata, patens. Pedunculus communis alternatim compressus, sub ramificationibus parum compressus.

Pedunculi partiales & pedicelli compressi.

Calyx margo superus; dentibus subulatis, brevissimis.

Corolla Cinch. caribaeae; tubo pollicari: Laciniae limbi lineares.

Filamenta capillaria, longitudine limbi.

Stylus longitudine filamentorum. Stigma ovatum, indivisum.

Capfula unguicularis, obovata.

#### CINCHONA BRACHYCARPA, PL. 8.

Cinchona panícula terminali, capfulis obovatis costatis, foliis ellipticis obtusis. Vahl. in Act. Havn. 1. p. 24. Swartz. Prod. 42. Mill. Dict. Mart.

Habitat in Jamaica.

Folia fere ut in macrocarpa, at sicuti tota planta glabra, brevissime petiolata.

Flores



*Cinchona brachycarpa?*



*Cinchona angustifolia?*



Flores duplo minores quam in præcedente.

Capfula obovata, lineis decem elevatis costata.

CINCHONA ANGUSTIFOLIA, PL. 9.

Cinchona panicula terminali, capfulis oblongis pentagonis, foliis lineari-lanceolatis pubescentibus. Swartz. Prod. 42. Aët. Holm. 1787. p. 117--123. t. 3. Vahl. in Aët. Havn. 1. p. 25.

Habitat in Hispaniola.

Rami cortice cinereo. Ramuli simpliufculi, pubescentes.

Folia petiolata, acuminata, obtufiuscula, fubtus pubescentia.

Petoli breves, pubescentes.

Stipulæ ovatæ, acutæ.

Panicula trifida vel trichotoma. Pedunculi pedicelli villofo-pubescentes.

Calyx pubescens: dentibus subulatis, longitudine germinis.

Corolla Cinchonæ caribææ, at longior.

Stigma incrassatum, oblongum, integrum.

Capfula oblonga, teretiufcula. Schwartz. l. c.

MR.

## MR. BROWN'S LETTER.

SIR,

HAVING been informed of your intention of publishing an account of the different species of the genus *Cinchona*, permit me to present you with a species of Peruvian Bark new at least to me, and which I believe is very little known in this country \*.

In the year 1793 I was engaged to go Surgeon of the *Speedy Transport*, Captain Thomas Melvill, belonging to Mr. Enderby and Sons, Paul's-Wharf, London. We were first bound to New South Wales with provisions, and afterwards on the Sperm whale fishery along the coasts of Chili and Peru. While fishing near the Gallapagoe islands, our crew unfortunately being seized with the sea scurvy, it was found absolutely necessary to make the main in order to refresh them. The Captain intended Manta for this purpose, a small Indian village lying to the southward of the Equator; but the wind and current baulking us, we were obliged to bear away and run for Tecamez, another Indian village, situated in 16 miles north latitude, and probably near 80 degrees west longitude. Here

\* This appears certain from a collation of the leaves with all the species, preserved in Sir Joseph Banks's Herbarium, with none of which they agree. A most faithful representation of these leaves is given at plate 11.



*Leaves of the Barks Tree, of Tecamez?*



we lay for ten days, until our people were mostly recovered.

As the province of Quito, to which Tecamez belongs, is celebrated for producing the Peruvian Bark, I confess I was uncommonly anxious to see a tree so justly valuable for its various medicinal virtues. But the sort commonly used in Europe grew more in the interior parts of the country than the places I visited; and my attention was called to a new species, which I was informed had been found singularly efficacious by the medical gentlemen in South America. As the master of the ship who gave me the intelligence, and who traded in it, was unfortunately to sail the next morning, he first very obligingly agreed with an Indian to take and shew me the tree, and at the same time spoke to the Governor in my favour, who kindly promised to supply me with a small quantity of its best kind—a promise he afterwards very generously performed.

That attention which was due to the state of our sick prevented me from many enquiries that otherwise might have been made on the subject; but from the limited opportunities I had of making observations, Tecamez Bark seems to be all of one species, as the trees I examined were of the same kind, and the fineness of their bark was estimated by the age of the tree. Young trees of two years old were much valued, their Bark being thin, brittle, aromatic and astringent.

astringent. That of old trees is thicker; when dried turns blackish on the inside, and of a darkish red in the middle. The other when broke is of a paler red, but all of them when left to dry in the sun twist themselves close together, and turn very dark on the inside. This circumstance, however, may be easily prevented; for, by peeling off the thin inside skin as it is taken from the tree, and exposing the Bark not too hastily to the sun, it will assume a fine cinnamon colour, and appear very handsome to the eye.

Notwithstanding the predilection in favour of the young tree, I am apt to suppose its Bark possesses only an imaginary virtue. When reduced to powder, both are so nearly alike, that it is extremely difficult to distinguish them: and in whatever form it is given, they are equally powerful and efficacious. A gentleman of some eminence told me that he thought them a tenth stronger than the Cortex usually sold in London. As I had some of the latter in substance from the Hall, whose genuineness I knew could be depended upon, the following is an observation or two I made on that subject. Teca-mez Bark differs from that sold by the Hall in colour, strength and taste. Its colour is more a brownish green, spread over with a whitish moss; the inside darker, and of a deep red inclinable to black. When broke it appears of a pale red, and has a most pleasant bitter taste, rather aromatic, but not so astringent as that I had in the  
 medicine

medicine chest. When boiled however with the same quantity of water, or infused in it when cold, its strength is superior, and its taste far more agreeable. If its virtues are drawn off by spirits, they equal that I had from the Hall, and in four cases sat easy upon the stomach, when the other did not. As many of our people unhappily laboured under a severe ague on our return, I thought that a proper opportunity of trying their effects; for, whatever may be advanced to the contrary, experience has taught me that in many instances Bark is highly serviceable in this disorder. Having selected two people with the same symptoms, I gave it to them in equal doses, and by the use of Tecamez Bark one recovered a week before the other. I tried it again—the difference was five days. I had only an opportunity of repeating it a third time, and it was seven. But I would not wish to be understood as if I thought these few cases sufficient to ascertain its superior effects with certainty. That must be left to future experiments, and to gentlemen of greater penetration, and who have more ample opportunities of making them than the writer of this article can pretend to possess.

All the trees I saw grew on the side of a hill, and in a dry barren soil. The mould was of a red colour intermixed with small stones, and not above a foot deep; for several of their roots appeared at the surface, and few that I examined were covered more than two inches by the earth. None of them were in bloom in August, nor



had the least appearance of feed. Neither could I obtain any of it at Tecamez. This is an article they set very little value on themselves, and are wonderfully surprised it should be enquired after. Of the tree indeed they are more careful, and very cautious in shewing it. Had it not been for the friendship of the gentleman I mentioned, it is more than probable I should have returned without seeing it at all.

I remarked that all the Bark Trees I saw grew on the side of a hill, and in a dry rocky soil. None of them exceeded two feet in circumference, nor any of them 24 feet in height. The mode the Indians use in stripping the tree, is by making longitudinal incisions in the bark about two inches broad, and two feet long. They then tie it up in bundles, thirty-two pounds each, and keep it in that state for a day or two. Their reason for tying it up in this manner is to prevent its too hastily drawing itself together by the heat, though it labours under a great disadvantage of appearing iron-coloured, and not so handsome to the eye as when it is at once exposed to the sun, and regularly turned and dried. Indeed, in drying Bark great care ought to be taken that it is not put away too suddenly. It should be perfectly crisp, and break short in two—it is then fit for use.

Their method of conveying it from one place to another is by stowing it in large leathern trunks. When the trunk is damp it is apt to get mouldy : but this they consider as of small importance ; for by drying it in the sun its mouldiness



diness in a short time disappears, and they affirm its virtues are not at all lessened by such an accident. The price it fetches at Guayaquil is 1s. 3d. per pound, while the common sort sells at 1s.

Tecamez Bark is used for all disorders in which the common Peruvian Bark is found serviceable; but it is imagined to possess a peculiar efficacy in removing indigestion, weakness of the stomach, and in restoring a debilitated constitution. It is also said to be powerful in repelling all tendencies to mortifications, and to be highly serviceable in femoral weaknesses and gleans—a complaint to which the inhabitants of South America are not a little subject.

The mode of giving Tecamez Bark is various, and depends in a great measure upon the disease for which it is prescribed. As it sits easy upon the stomach and creates little or no nausea, it may be exhibited in any form that is most agreeable. A Surgeon of great eminence told me the best mode of using it was in a cold infusion. He poured sixteen ounces of cold water over one ounce of the Bark coarsely powdered, and let it stand four hours. He sometimes simmered it afterwards over a slow fire for ten minutes, and, having strained the decoction, added two ounces of spirits, and gave three table-spoonfuls occasionally. But very often he omitted boiling it, and, having added the same quantity of spirits, gave the cold infusion as I have mentioned.

Such, Sir, are a few hasty observations on this new species of Peruvian Bark. They are very limited, I confess; for my opportunities of enquiry were not only few, but sometimes interrupted. If, however, they awake the attention of Gentlemen, who are not only more capable of treating the subject, but have better opportunities of trying its effects than I can pretend to be possessed of, my intention in sending you these trifling and imperfect hints will be fully answered.

I have the honour to be, Sir,

With due respect,

Your most obedient Servant,

D. BROWN.

Dec. 5, 1796.

P. S. I omitted to mention, that upon my arrival at Lisbon I was informed of the Yellow Bark being in great repute, and was favoured with the sensible and ingenious essay that has been written on the subject. It occurred to me that this new Bark might be of the same sort; and I shewed it to Mr. Baker, an English Surgeon of the most extensive practice in the place, who likewise gave a specimen of it to the first Physicians in that city. Upon an accurate examination they found it a very distinct species, and of a kind they had never seen. They told me they did not think any of it before had been brought to Europe.

The

The Sandal Tree\* likewise abounds at Tecamez, and is mostly found in the same soil as the Bark Tree. Its gum is used by the Spaniards for perfuming their chambers—incensing the altar at high mass, and in many other religious ceremonies. The Indians likewise use its leaves by rubbing them between their hands, and applying them bruised to their temples, as a certain cure for the head-ach after severe drinking. The Boldu is also used in the same manner for this purpose. Whether the Sandal Tree is the same whose gum is so valued for religious purposes in the East Indies (as I was informed it was), or whether it is a distinct species of itself, I am unfortunately not verfed enough in botanical researches to determine.

\* A different plant from the Sandal Wood of the East Indies (*Sirium myrtifolium* Lin.), as appears by a specimen of the wood brought over by Mr. Brown, and now in my possession: this wood, which abounds with resin, has very much the smell, when burnt, of the Yellow Gum of Botany Bay.

CINCHONA LONGIFLORA, PL. 12\*.

*Cinchona* pedunculis axillaribus unifloris, foliis linearilanceolatis glabris, corolla longissima.

*Cinchona* Caribæa? Journ. de Phys. Oct. 1790. p. 243. t. 1 †.

Habitat in Guiana.

CINCHONA SPINOSA, PL. 13.

*Cinchona* foliis minimis subrotundis, pedunculis unifloris, corollis glabris quadrifidis tetrandris, feminibus subemarginatis.

Folia aliquando bina opposita, aliquando terna verticillata.

Lin. Syst. Veg. Gmel. p. 361.

Vavasseur, Journ. de Phys. Oct. 1790 p. 243. t. 2.

Habitat in Domingo—Baron de Beavais.

\* From a specimen in Aublet's Herbarium, now in the possession of Sir Joseph Banks.

† This appears to be a very different plant from *Cinchona Caribæa* Lin.

Figures 1, 2, 3, 4, 5, 6, are taken from Tab. above quoted in the Journ. de Physique.

The



*Cinchona longiflora?*



*Cinchona sp.*





The virtues of the genus *Cinchona* are so well described in Dr. Woodville's excellent publication, intitled *Medical Botany*, that we have taken the liberty to copy the Doctor's account with scarce any material alteration. It is as follows, viz.

WE seem to have no satisfactory account at what time, or by what means, the medicinal efficacy of the Peruvian Bark, which is now so well established, was first discovered. Some contend that its use in intermittent fevers was known to the Americans long before the Spaniards possessed Peru, but that they concealed this knowledge from the Europeans; and, on the contrary, it is asserted by others, that the Peruvians never supposed it to be fit for any medicinal use, but thought that the large quantities exported thence were for the purpose of dyeing, and they actually made some trials of its effects in this way \*. Condamine says, that according to an ancient tradition, the Americans owe the discovery of this remedy to the lions, which some naturalists pretend are subject to a kind of intermitting fever, of which they were observed to be cured by instinctively eating the Bark of the *Cinchona*. But Geoffroy states, that the use of the Bark was first learned from the following circumstance:—Some *Cinchona* trees being thrown by the winds into a pool of water, lay there till the water became so bitter that every body refused to drink it. However, one of the neighbour-

\* Ulloa, Voyage de l'Amerique meridionale, t. i. p. 271.

(\*) voir la note mise aux Esata, après la préface.



ing inhabitants being seized with a violent paroxysm of fever, and finding no other water to quench his thirst, was forced to drink of this; by which he was perfectly cured. He afterwards related the circumstance to others, and prevailed upon some of his friends who were ill of fevers to make use of the same remedy; with whom it proved equally successful\*. The use of this excellent medicine, however, was very little known till about the year 1638; when a signal cure having been performed by it on the Spanish viceroy's lady, the Countess del Cinchon, at Lima, it came into general use, and hence was distinguished by the appellation *Pulvis Comitissæ*, or the Countess's Powder; also called, *Cortex china china*, or *chinchina*; *kina kina*, or *kinkina*; and *quina quina*, or *quinquina*. On the recovery of the Countess she distributed a large quantity of the Bark to the Jesuits, in whose hands it acquired still greater reputation, and by them it was first introduced into Europe †, and hence called *Cortex*, or *Pulvis jesuiticus*, *Pulvis Patrum*; and also *Cardinal de Lugo's Powder*, because that charitable prelate bought a large quantity of it at a great expence for the use of the religious poor of Rome.

“ This Bark is brought to us in pieces of different sizes, some rolled up into short thick quills, and others flat: the outside is brownish, and generally covered in part with a

\* *Mat. Med. Traité*, p. 78. &c.

† Louis the Fourteenth, when Dauphin, was said to be one of the first in Europe who experienced its efficacy.

whitish

whitish mofs: the inside is of a yellowish reddish or rusty iron colour. The best sort breaks close and smooth, and proves friable betwixt the teeth: the inferior kinds appear when broken of a woody texture, and in chewing separate into fibres. The former pulverizes more easily than the latter, and looks, when powdered, of a light-brownish colour, resembling that of cinnamon, or somewhat paler. It has a slight smell, approaching as it were to mustiness, yet so much of the aromatic kind as not to be disagreeable. Its taste is considerably bitter, astringent, very durable in the mouth, and accompanied with some degree of aromatic warmth, but not sufficient to prevent its being ungrateful \*."

Besides this Bark, that of several other species of *Cinchona* have been recommended for medical use by different authors, especially the *Cortex peruvianus ruber*, or red Bark; also that of the *Cinchona caribæa*, or the Jamaica Bark; that of *Cinchona floribunda* produced at St. Lucie; and that of two or three other species discovered at Santa Fé. The first of these "is in much larger and thicker pieces than the common; most of the pieces are concave, though not rolled together like the quilled Bark. They break short, like the best common Bark, and appear evidently composed of three layers. The outer is thin, rugged, frequently covered with a mossy substance, and of a reddish-brown colour. The middle is thicker, more

\* Lewis, M. M. p. 485.

compact, and of a darker colour : it is very brittle and resinous. The innermost layer is more woody and fibrous, and of a brighter red. In powdering this Bark, the middle layer, which seems to contain the greatest proportion of resinous matter, does not break so readily as the rest ; a circumstance to be attended to, lest the most active part should be left out of the fine powder. This red Bark to the taste discovers all the peculiar flavour of the Peruvian Bark, but much stronger than the common officinal sort. An infusion in cold water is intensely bitter, more so than the strongest decoction of common Bark. Its astringency is in an equal degree greater than that of the infusion of common Bark, as is shewn by the addition of martial vitriol. The spirituous tincture of the red Bark is also proportionably stronger than that of the pale. The quantity of matter extracted by rectified spirit from the powder of the former was to that from the latter as 3 to 2 in one experiment, and as 229 to 130 in another ; and yet on infusing the two residuums of the first experiment in boiling water, that of the red Bark gave a liquor considerably bitter, and which struck a black with martial vitriol ; while that yielded by the other, was nearly tasteless and void of astringency\*.”

Respecting the medicinal properties we have several respectable authorities, shewing, that as the red Bark possesses the same virtues with the common, in a much higher

\* Lewis, l. c.

degree,

degree \*, so it has been found of more efficacy in the cure of intermittents : and hence it is thought to be that which, according to Arrot, the Spaniards called *Cascarilla colorada*, and was probably the kind originally brought to Europe, and which proved so successful in the hands of Sydenham, Morton, and Lister ; for it appears from the testimony of the oldest practitioners, that the Bark first employed here was of a much deeper colour than the common Bark †. The red Bark was first imagined by Dr. Saunders ‡ to be that of the trunk of full grown trees, the branches or young trees of which yield the pale or common Bark : but this opinion the Doctor seems afterwards to have abandoned ; for in the third edition of his pamphlet on this subject he says, “ that he has lately seen some exceedingly good red Bark imported by a Spanish merchant, a considerable part of which was as small as the quilled Bark in common use, &c. It was extremely refinous, and gave evident proofs of its being the quill of the larger red Bark which was in the same chest.” If the pale and red Bark were really the produce of the same species of *Cinchona*, the latter differing from the former only by acquiring greater maturity, we should find the deepness of the colour of the pale Bark to correspond proportionably with its thickness or the size of the quill, which is certainly not the case. The *Cinchona caribæa* is described

\* Irving's and Skeete's Experiments.

† Baker, *Med. Trans.* vol. iii. p. 161.

‡ Observations on the superior efficacy of the red Peruvian Bark in the cure of fevers.

and figured by Jacquin \* and Dr. Wright †; it grows in Jamaica, where it is called the Sea Side Beech. According to Dr. Wright, the Bark of this tree is not less efficacious than that of the Cinchona of Peru, for which it will prove an useful substitute; but by the experiments of Dr. Skeete it appears to have less astringent power ‡. The Cinchona floribunda, or Bark tree of St. Lucie, a figure of which we find in Phil. Transf. also in Rozier's Observations sur la Physique, affords a Bark which is likewise said to have been used with advantage; but notwithstanding all that has been written to establish its medicinal character §, it seems to us greatly inferior to that of the other species of this genus. In its recent state it is considerably emetic and cathartic; properties, which in some degree it retains on being dried; so that the stomach does not bear this Bark in large doses, and in small ones its effects are not such as to give it any peculiar recommendation. Several species of Cinchona have lately been discovered at Santa Fé, yielding Barks both of the pale and red kind; and which, from their sensible qualities, are likely upon trial to become equally useful with those produced in the kingdom of Peru ||.

\* Amer. Picl. tab. 23.

† Phil. Transf. vol. 67.

‡ Exper. p. 339.

§ See Kentish. Exp. and Observ. on the Peruvian Bark. Davidson in Phil. Transf. vol. 74. and Transf. of the American Phil. Soc. vol. 2. Mallet in Mem. sur le Quinquina de la Martinique, &c.

|| See Memoria o Dissertazione sopra la nuova China del regno de St. Fé, &c.

At present the use of the Bark is chiefly confined to the pale and red kind; and the nearer the former resembles the latter, the more it is esteemed.

“ The Peruvian Bark yields its virtues both to cold and boiling water; but the decoction is thicker, gives out its taste more readily, and forms an ink with a chalybeate more suddenly than the fresh cold infusion. This infusion, however, contains at least as much extractive matter, but more in a state of solution; and its colour on standing with the chalybeate becomes darker, while that of the decoction becomes more faint. When they are of a certain age, the addition of a chalybeate renders them green; and when this is the case, they are found to be in a state of fermentation, and effete. Mild or caustic alkalies, or lime, precipitate the extractive matter, which in the case of the caustic alkali is re-dissolved by a farther addition of the alkali. Lime-water precipitates less from a fresh infusion than from a fresh decoction; and in the precipitate of this last some mild earth is perceptible. The infusion is by age reduced to the same state with the fresh decoction, and then they deposit nearly an equal quantity of mild earth and extractive matter; so that lime-water as well as chalybeate may be used as a test of the relative strength and perishable nature of the different preparations, and of different Barks. Accordingly, cold infusions are found by experiments to be less perishable than decoctions; infusions and decoctions of the red Bark, than those of the pale: those of the red Bark, however, are found by length  
of

of time to separate more mild earth with the lime-water, and more extracted matter. Lime-water as precipitating the extracted matter appears an equally improper and disagreable menstruum. Water has been found to suspend the resin by means of much less gum than has been supposed. Rectified spirit of wine extracts a bitterness, but no astringency, from a residuum of twenty affusions of cold water; and water extracts astringency, but no bitterness, from the residuum of as many affusions of rectified spirit. The residua of both are insipid \*."

From many ingenious experiments made on the Peruvian Bark by Dr. Irving, published in a Dissertation which gained the prize-medal given by the Harveian Society of Edinburgh in 1783, the power of different menstrua upon Peruvian Bark is ascertained with greater accuracy than had before been done: and it appears, that, with respect to comparative power, the following fluids act in the order in which they are placed: Dulcified spirit of vitriol: Caustic lye: French brandy: Rhenish wine: Soft water: Vinegar and water: Dulcified spirit of nitre: Mild volatile alkali: Rectified spirit of wine: Mild vegetable alkali: Lime-water. The antiseptic powers of vinegar and Bark united are double their sum taken separately. The astringent power of the Bark is increased by acid of vitriol; the bitter taste is destroyed by it.

\* Ed. New Dispens. p. 251.



Though the Bark on its first introduction, and even some time afterwards, was reprobated by some eminent physicians as a dangerous remedy ; yet these prejudices are entirely done away, and its character is now universally established : so that the disputes which at present subsist are confined to its mode of operation, or the manner in which it is most efficaciously administered. To detail these, however, or even to give a circumstantial relation of the various states of disease in which the Bark might be advantageously employed, would far exceed our limits : we are therefore confined to state briefly those diseases to which this medicine is more especially adapted.

The Bark first acquired its reputation for the cure of intermittent fevers, and in these, when properly exhibited, it rarely fails of success. For this purpose, some practitioners prefer giving it just before the fit, some during the fit, and others immediately after. Dr. Cullen, who is of the first opinion, says, " I am satisfied that giving a large dose of the Bark immediately before the time of accession, is the most proper practice : but as that dose must not be under two drams of pale Bark, so there are some stomachs which will not bear even that quantity, or a larger that might be necessary. It is commonly, therefore, convenient to give small doses, but to give them every hour for some hours near to the times of accession\*."

\* Mat. Med. vol. p. 97.



Some again order it in the quantity of an ounce between the fits; the dose being more frequent and larger, according to the frequency of the fits; and this mode of procedure, although it may perhaps lead to the employment of more Bark than is necessary, is considered by Dr. Duncan \* as upon the whole preferable, from being best suited to most stomachs. When the Bark pukes, or purges, or oppresses the stomach, it is to be counteracted by remedies particularly appropriated to them. Thus, vomiting is often restrained by exhibiting it in wine; looseness, by combining it with opium; and oppression at the stomach, by the addition of an aromatic. But unless for obviating particular occurrences, it is more successful when exhibited in its simple state than with any addition.

It may be given from the very commencement of the disease without any previous evacuations, though it commonly answers better after emptying the alimentary canal, particularly the stomach; and it is to be continued not only till the paroxysms cease, but till the natural appetite, strength, and complexion return.

In remittent fevers, especially during the times of remission, the Bark may also be employed with great success; for as both these and intermittents arise from the

\* See New Edinburgh Dispensatory.

same cause, prevail at the same seasons, and assume mutually the form of each other, they show a strict affinity, and found a presumption which is confirmed by experience, that they may be cured by the same remedy. In continued fevers, or typhus of the nervous and putrid kind, the Bark is very generally used, as well suited to counteract the debility or putrescency which marks the progress of the disorder. There is, however, one state not unfrequently present in these epidemic fevers, in which the Bark is found to be hurtful; i. e. symptoms of congestion, or topical inflammation of the head, manifested by headach, redness of the eyes, and phrenitic delirium. And whenever delirium is accompanied with much subfultus tendinum, or frequent convulsive twitchings of the limbs, Dr. Cullen thinks opium in large doses is the only remedy to which we can trust.

Of late the Bark has been much employed in acute rheumatism, particularly after the violence of the disease has been in some measure moderated by the antiphlogistic treatment, or when evident remissions take place. Many, however, have recourse to this medicine in the first stage of the disease, and we have witnessed its success in some of the London Hospitals, even while the inflammatory symptoms prevailed to a very considerable degree. This seems contrary to the experience of Dr. Cullen, who says, "As I consider this disease as especially

G

consisting

consisting in a phlogistic diathesis, I hold the Bark to be absolutely improper, and have found it manifestly hurtful, especially in its beginning, and in its truly inflammatory state."

In the confluent small-pox the Bark has been recommended to promote the rising of the pustules. This opinion our own experience teaches us to reject; but after the maturation of the pustules is completed, or where symptoms of putrescency, or a dissolved state of the blood, supervenes, the Bark cannot be too liberally employed. The other diseases in which the Bark is recommended, are gangrenous fore throats, and indeed every species of gangrene; scarletina, dysentery, all hemorrhages of the passive kind; likewise other increased discharges; some cases of dropsy, especially when unattended with any particular local affection, scrophula, ill-conditioned ulcers, rickets, scurvy, states of convalescence, certain stages of phthisis pulmonalis, &c.

The officinal preparations of the Bark are the powder, the extract, the tincture, and the decoction. This last, though frequently employed, is in many respects inferior even to a simple watery infusion; but the best form is that of powder, in which the constituent parts are in the most effectual proportion.

---

The

The virtues of *Cinchona Macrocarpa*, a new species, have been lately described by Dr. James Clarke in his Treatise on the Yellow Fever, where a comparative table of the quantity of soluble or extractive matter obtained from the different species of Bark by water and spirit is exhibited.

---

HYÆNANCHE GLOBOSA, PL. 10.

HYÆNA POISON.

DIGECIA POLYANDRIA.

Syn. *Iatropa globosa* Gærtn. vol. 2. p. 122. t. 109.

*Croton foliis crassis, venosis, venis rubentibus,*  
Burm. Afric. p. 122. t. 45.

Arbor parva, sex aut septem pedes alta, ramis diffusis.

Cortex cinereo-fuscus, rugosus, articulatus, cicatricibus  
ad articulos notatus quo petiola foliorum antea exte-  
rant.

Folia verticillata, terna vel sæpius quaterna, petiolo  
brevis canaliculato, ovato-oblonga, emarginata, integer-  
rima, lævigata, nervoso-reticulata, revoluta.

*Feminei* flores in axillis foliorum pedunculis multiflo-  
ris brevibus.

Calyx squamosus, imbricatus, squamulis ovato-acumi-  
natis apice scariosis, deciduis.

Corolla





Prot. Buser del.

*Hyascanche globosa* 5 cm

J. Dierke, fculp.



Corolla nulla.

Pericarpium capsula corticata, fuberosa, quadricocca, coccis lignosis bivalvibus dispermis.

Styli 2 aut 4.

Stigmata quatuor reflexa, glandulosa, fimbriata.

Semina duo in unaquaque cocca, ovata, compressa, glabra, umbilico fuberoso.

*Masculi* flores in axillis foliorum racemis congestis numerosis subsessiles.

Calyx polyphyllus, foliolis ovatis, concavis coloratis (Calyculatus squamis ad basin foliorum?).

Corolla nulla.

Filamenta numerosa brevia: Antheræ subrotundæ didymæ.

This shrub grows about two hundred miles from the Cape, in a rocky soil, on a single spot, on Wind-Hook Mountains, near Elephants' River.

A farmer lives there, who collects the fruit, by which



he makes a profit of about 20 l. per annum, by selling it for the purpose of poisoning hyænas. The fruit is pounded into a powder, and administered in the same manner as the Nux Vomica. The powder is put into the carcases of lambs, &c. which are laid where the hyænas are known to come. By eating the flesh they are infallibly destroyed.

This plant flowers and bears fruit annually in the stove of the Right Honourable the Earl of Tankerville, at Walton, the only place it has yet flowered at in this country; and I believe it is in no other collection in England except at Kew. Our figure of the female was drawn from the plant in his Lordship's stove in 1795; the male from a specimen very obligingly communicated to me by Mr. F. Maffon.

F I N I S.

ORDER OF THE PLATES.

- Plate I. *Cinchona officinalis*.  
2. *Cinchona pubescens*.  
3. *Cinchona macrocarpa*.  
4. *Cinchona caribæa*.—This plate is from a specimen in the Herbarium of Hen. de Ponthieu, Esq. now in my possession.  
5. *Cinchona corymbifera*.—From specimens and drawings in the Herbarium of Sir Joseph Banks.  
6. *Cinchona lineata*.  
7. *Cinchona floribunda*.—From a specimen in the Herbarium of Sir Joseph Banks; found by Mr. Fran. Maffon in St. Lucie.  
8. *Cinchona brachycarpa*.—From a specimen in the Herbarium of Sir Joseph Banks.  
9. *Cinchona angustifolia*.  
10. *Hyænanche globosa*.  
11. Leaves of Tecamez Bark.  
12. *Cinchona longiflora*.  
13. *Cinchona spinosa*.



5314 (3)

AN  
ILLUSTRATION  
OF THE  
GENUS CINCHONA;

COMPRISING  
DESCRIPTIONS OF ALL THE OFFICIAL PERUVIAN BARKS,  
INCLUDING SEVERAL NEW SPECIES.

BARON DE HUMBOLDT'S  
ACCOUNT OF THE CINCHONA FORESTS OF SOUTH AMERICA:

AND  
LAUBERT'S MEMOIR  
ON THE DIFFERENT SPECIES OF QUINQUINA.

TO WHICH ARE ADDED,  
SEVERAL DISSERTATIONS OF DON HIPPOLITO RUIZ,  
ON VARIOUS MEDICINAL PLANTS OF SOUTH AMERICA.

WITH SEVERAL PLATES.

AND A SHORT ACCOUNT OF  
THE SPIKENARD OF THE ANCIENTS,

WITH A PLATE,  
BY AYLMER BOURKE LAMBERT, ESQ. F.R.S. A.S. & G.S.

VICE-PRESIDENT OF THE LINNEAN SOCIETY, AND MEMBER OF THE ROYAL ACADEMY  
OF SCIENCES OF MADRID, &c. &c. &c.

---

LONDON:  
PRINTED FOR JOHN SEARLE, 77, LOWER GROSVENOR-STREET;  
AND LONGMAN, HURST, REES, ORME, AND BROWN, PATERNOSTER-ROW.

1821.





TO  
THE CELEBRATED  
**BARON DE HUMBOLDT,**  
THE MOST SCIENTIFIC TRAVELLER THIS OR ANY OTHER AGE HAS PRODUCED,

WHO, AS SUCH,  
HAS DONE MORE FOR THE PROMOTION OF HUMAN KNOWLEDGE THAN ANY  
THAT HAS PRECEDED HIM,

AND  
WHOSE NAME WILL REMAIN ONE OF THE BRIGHTEST IN THE ANNALS OF SCIENCE  
TILL THE END OF TIME,

**THIS WORK**  
IS INSCRIBED,  
WITH THE GREATEST ESTEEM AND RESPECT,

BY  
**AYLMER BOURKE LAMBERT.**

## CONTENTS.

---

DESCRIPTIONS of the species of the genus <i>Cinchona</i> . By A. B. LAMBERT, Esq. &c. &c.....	Page 1
---	--------

An account of the Cinchona Forests of South America; drawn up during five years residence and travels on the South American continent. By ALEXANDER BARON VON HUMBOLDT. *Translated from the German*.....Page 19

Memoir on the different species of *Quinquina*. By M. LAUBERT, Chief Physician to the Spanish army. *Translated from the French*.....Page 60

Description of the tree which produces the Balsam of Tolu and Peru, and known under the name of *Quinquino* in the kingdom of Peru. By DON HIPOLITO RUIZ, First Botanist to the King of Spain in the Expedition to Peru. *Translated from the Spanish* .....Page 92

Memoir on the virtues and uses of the plant called in Peru *Cala-guala*. By the same Author .....Page 98

On the virtues and uses of the *Monnina Polystachya*, called *Yallhoy* in Peru. By the same Author .....Page 131

On the virtues and uses of *Aristolochia Fragrantissima*, called by the natives of Peru *Bejuco de la Estrella*. By the same Author....Page 175

An account of the *Spikenard* of the Ancients. By A. B. LAMBERT, Esq. &c. &c.....Page 177

---

## PREFACE.

---

THE great additions made to the genus *Cinchona* since the publication of the author's former account,\* by the celebrated authors of the *Flora Peruviana*, Don Hippolito Ruiz and Don Jose Pavon, and by the illustrious travellers Humboldt and Bonpland, have induced him to give the following Illustration, which may be either considered as supplementary or as forming a distinct work. He has entirely confined himself to the botanical definitions of the species, and hopes he has been successful, in many instances, in giving more correct diagnoses of the species than has hitherto been done. The very valuable memoirs of Humboldt and Laubert (of which he has here for the first time given translations) will afford every other information relating to their history, and the various qualities of their barks. The Dissertations of Don Hippolito Ruiz on various plants of South America, esteemed for their medicinal virtues, are almost wholly unknown in this country. They are highly deserving attention, as they contain much valuable and instructive information, not only to medical men but to the general reader. Many orthographical errors have, he fears, unavoidably crept into the

\* Description of the genus *Cinchona*. London, 1797.



translations of these Memoirs; but these the candid and liberal-minded reader will rather be inclined to pardon than condemn. If he has succeeded in giving the meaning of his authors, his chief wish will be attained.

The Author has lately received an extensive *Herbarium*, containing nearly the whole of the plants collected by the celebrated authors of the *Flora Peruviana*, and their pupils, in Peru, Chili, and Mexico; the number of which amounts to five thousand seven hundred species. The specimens are in the highest state of preservation; and with several duplicates of most of the species. It will not, perhaps, prove uninteresting to the botanical reader, to have a general view of the extent of this magnificent collection, he therefore shall subjoin the number of species in some of the natural orders, and also in some of the genera.

*Natural Orders.*

Cyperoideæ, Juncæ, et Gramineæ . . . . .	230
Labiata . . . . .	250
Ericinæ et Rhodoraceæ . . . . .	25
Compositæ . . . . .	728
Umbelliferæ . . . . .	48
Cruciferae . . . . .	15
Malvaceæ . . . . .	168
Leguminosæ . . . . .	500
Orchideæ . . . . .	150
Filices . . . . .	208

*Genera.*

Convolvulus 62. Psychotria 54. Solanum 90. Alchemilla  
5. Lobelia 30. Verbena 26. Laurus 38. Buddleja 10.  
Tournefortia 12. Mimosa 121. Salvia 66. Croton 61. Quer-  
cus 19. Urtica 29. Ficus 30. Passiflora and Tacsonia 31.  
Cleome 11. Bignonia 32. Gentiana 20. Asclepias 22. Cy-  
nanchum 27. Melastoma 41. Myrtus 29. Myristica 6.  
Euphorbia 22. Theophrasta 5. Barnadesia 4. Gnaphalium 19.  
Aster 54. Eupatorium 79. Senecio 41. Helianthus 30. Ste-  
via 27. Cacialia 37. Werneria 20. Tagetes 15. Verbesina 25.  
Bidens 20. Melampodium 12. Culcitium 5. Cecropia 11.  
Acalypha 24. Clusia 21. Aralia et Actinophyllum 15.\*

This collection also contains numerous specimens, both in flower and fruit, of all the species of the highly interesting genus *Cinchona*, collected by the above-mentioned celebrated botanists and their pupils. He has, besides, received part of a collection which was taken in a Spanish prize bound from Lima to Cadiz; part of whose cargo was sold in London, among which was a fine collection of *Cinchonæ*, purchased by Mr. Thompson, of Sloane Square, who had the kindness to give him

\* The author daily expects from his friend M. Pavon, specimens of the plant called *Aracacha*, about which so much has been said in our newspapers and periodical works. It is his intention to give a description and figure as soon as they arrive. The letter of M. Pavon relating to this plant is as follows:—"The *Aracacha* I conceive to be a species of *Daucus*; its root I have frequently eaten, the taste resembles that of parsnip. The plant is cultivated by the Indians, who make much use of it. There exists in Peru a small quadruped which the Indians call *Missu*, and which is very fond of the root of the *Aracacha*. They sometimes destroy in one night a whole field that is planted with it. I once possessed one of these animals, which I domesticated from having it young. I decided that it belonged to the genus *Mus*, and the species called *Mus aguti* by Linneus, and described by M. Valmont de Bomare in his Dictionary of Natural History."

the duplicates. He has been enabled by these means to ascertain satisfactorily all those figured in the *Flora Peruviana*, besides several new species; and in many instances, also, to clear up the many doubts and errors, which have long pervaded this valuable but intricate genus of plants. He has divided the whole into five sections, and given to each of the species specific differential characters. The author has, in several cases, been obliged unwillingly to differ from the opinion of his friend the Baron de Humboldt, regarding the species figured in the *Flora Peruviana*; but the accidental advantage of his being in possession of the specimens from which these figures were taken, and of having others named by M. Bonpland himself, will, he hopes, justify him in doing so. He intends hereafter to give figures of all the species here described. It was a very fortunate circumstance for him, that the celebrated Don Francisco Antonio Zea, whose authority is of such weight in this genus, was residing very lately for a considerable time in this country; and to whom he had shown all his specimens, and who agrees with him in most of the statements he has given. At the end of the specific descriptions, is added a list of the different kinds of Peruvian barks with their names, fine samples of which, amounting to forty-four sorts, he received from his much valued friend Don Jose Pavon.

The interesting pamphlet of Don Hippolito Ruiz, on the *Myroxylon Peruiferum*, he has here for the first time presented in the English language, and has added to it a plate, taken from very fine specimens, received from his often mentioned friend Pavon. It may here be interesting for botanists to learn, that the plates are finished of the fourth and fifth unpublished volumes of the

*Flora Peruviana*, containing in all two hundred and twenty-three figures.

In the last place, he may notice a circumstance, which, although foreign to the present subject, will nevertheless be interesting information to all the lovers of botany in this country. In a letter he lately received from his friend Don Mariano Lagasca, Professor and Director of the Royal Botanic Garden at Madrid, he notices the safe arrival there of the whole collections of the celebrated Don Jose Cœlestino Mutis, of Santa Fe de Bogota, New Granada, comprising six thousand seven hundred and sixty-nine splendid drawings of his intended *Flora Bogotensis*; besides eighty-five boxes containing specimens of plants, gums, woods, fruits, seeds, &c. with many very valuable manuscripts.

Just as this work was printing, appeared in two volumes octavo, *The Correspondence of Linnæus*, edited by Sir James Edward Smith, the learned President of the Linnæan Society, among which are several letters of Mutis, containing many observations on the plants sent by him to Linnæus from South America; but, what is to be lamented, many of his letters never reached Linnæus; mention is made, however, of copies of them being kept by Mutis; and it is to be hoped that when his immense collections, which have arrived at Madrid, shall be examined, these letters may be found and given to the public. I have only to acknowledge my thanks to Mr. D. Don for his kind assistance in this work.

*London, June 2, 1821.*

# ERRATA.

Page 2, near the bottom, read the *C. lucumæfolia* for *cucumæfolia*.

3, read *lucumæfolia* for *cucumæfolia*.

4, near the bottom, read *duplo* for *dupol*.

6, near the bottom, after *acutis*, expunge *supra*, and after *diffusâ* read *ferrugineo-tomentosa*.

9, near the bottom, after *C. glandulifera*, *Fl. Peruviana*, insert a point of interrogation.

12, near the top, after *Kunth*, expunge the point, and instead of *Fl.* read *Pl.*

27, at the end of the note, insert *Edit*.

## DIRECTION FOR THE PLATES.

	PAGE
Myroxylon Peruiferum	- 97
Polypodium Calaguala	- 124
Monnina Polystachya	- 147
Aristolochia Fragrantissima	- 175
Valeriana Jatamansi	- 177

**SYNOPSIS**  
**SPECIERUM CINCHONÆ GENERIS.**

---

SECT. I.—*Corollis extus sericeo-tomentosis, limbo suprâ barbatis.*

- |                  |                 |
|------------------|-----------------|
| 1. Condaminea.   | 6. pubescens.   |
| 2. cordifolia.   | 7. micrantha.   |
| 3. rotundifolia. | 8. Humboldtii.  |
| 4. ovalifolia.   | 9. Pavonii.     |
| 5. purpurea.     | 10. macrocarpa. |

SECT. II.—*Corollis extus pilosis, limbo suprâ barbatis.*

- |              |              |
|--------------|--------------|
| 11. Mutisii. | 12. hirsuta. |
|--------------|--------------|

SECT. III.—*Corollis extus sericeo-tomentosis, limbo suprâ glabris.*

- |                   |                 |
|-------------------|-----------------|
| 13. magnifolia.   | 16. acutifolia. |
| 14. caduciflora.  | 17. stenocarpa. |
| 15. oblongifolia. | 18. dichotoma.  |

SECT. IV.—*Corollis omninò glabris.*

- |                  |            |
|------------------|------------|
| 19. grandiflora. | 21. rosea. |
| 20. acuminata.   |            |

SECT. V.—*Corollis omninò glabris; genitalibus longè exsertis e basi tubi  
ortis; stigmatè capitato integro; seminibus membranâ integerrimâ cinctis.*

22. triflora.

## DESCRIPTIONES SPECIERUM.

---

1. *C. Condaminea*, foliis ovali-lanceolatis acutis utrinque ramulisque denudatis nitidissimis, paniculâ brachiatâ ramosissimâ lævi, dentibus calycinis ovatis acuminatis, laciniis corollæ lineari-lanceolatis, stigmate emarginato, capsulis ovatis costatis.

*C. Condaminea.* Humb. et Bonp. *Plantæ Æquinoct.* 1. 33. t. 10. Humb. in *Mag. der Gesell. Naturf. Freunde. Berlin* 1807, p. 112. *Nova Gen. et Spec. Plant.* 3. 400. *Cinchona officinalis* Linn. *Sp. Pl.* ed. W. 2. p. 244. *Syst. Veg.* ed. 10. p. 929. *Condamine* in *Mém. de l'Academ. de Paris*, 1738, p. 114. *Lam. Ill.* t. 164. f. 1. *Vahl Skrivt. af Natur. Selfkab.* 1. t. 1. *Lambert. Monog.* t. 1. *C. stupea* Pavon Mss. *Cascarilla fina de Uritusinga Hispanorum.*

*β. lanceolata*, foliis lanceolatis utrinque acutis. *C. lanceolata* Fl. *Peruviana* 3. p. 1. t. 223. *C. lancifolia* Mutis, *period. de Santa Fe*, p. 465. *ejusd. Fl. Bogot. Mss.* Humb. in *Mag. der Gesell. Nat. Fr. zu Berlin* 1807, p. 116. *Alib. Traité des Fièvres.* p. 374. *J. Pombo Noticias var. sobre las Quinas officin.* p. 56. *C. nitida* Fl. *Peruviana* 2. p. 50. t. 191. *C. angustifolia* Ruiz et Pavon. *Quinol. Suppl.* p. 14. cum tabula f. a. *C. glabra* Ruiz *Quinol.* 2. p. 64. *C. fucumæfolia* Pavon Mss. *Quina Naranganda Bogotensium. Quinquina Orange. Quina primitiva directamente febrifuga. Mut. Quinol. (fide Humb.) Cascarilla officinul. Ruiz Quinol.* p. 56. *Cascarillo Lampino Ruiz Quinol.* 2. p. 64. 1/2



γ. foliis ovatis utrinque acutis, floribus majoribus.

*C. lutea* Pavon Mss. *C. colorata* ejusd. Mss.

δ. foliis subrotundis basi rotundatis apice acutiusculis.

Omnes habitant in montibus Loxæ in Regno Quitensi, et aliis regionibus montosis frigidis Peruvix. β etiam in Regno Novo-granatensi inter Guaduas et Santa Fe de Bogota, ubi legit celeberrimus Mutis.

This species varies extremely in the form of its leaves, so that no specific mark can be derived from their figure alone; I am not inclined to believe even that the varieties I have marked are permanent, but I have thought best to separate them as they appeared among my specimens. Bonpland regarded the scrobiculi on the leaves as a permanent differential character, notwithstanding their being found more or less numerous on the leaves of almost every species of the genus. I have no hesitation in reducing to this species the *C. lanceolata*, *nitida*, *glabra*, and *angustifolia* of Ruiz and Pavon, as proved by the numerous specimens, both in flower and fruit, I have received from the last-mentioned botanist; as also their unpublished *lutea*, *colorata*, *lucumafolia*, and *stuppea*. A great part of these specimens are from the mountainous forests of Loxa, and in all probability collected and sent home by their pupil Don Juan Tafalla. These specimens agree in every respect with the figure in Humboldt and Bonpland's *Plantæ Equinoctiales*; many of them, which were taken in a Spanish prize, as I have mentioned in the short preface to this work, I submitted to the examination of M. Bonpland while in this country, who considered them as identical with his *C. Condaminea*, and which agrees exactly with those specimens I have more recently



received from the celebrated author of the *Flora Peruviana et Chilensis*, Don Jose Pavon. The celebrated Mutis has, and I think too with great propriety, considered his *C. lancifolia* the *Quina Naranganda*, or Quinquina Orange of Santa Fe, as identical with the *quina fina de Uritucinga*, or Humb. and Bonpland's *C. Condaminea*. No description is given of the *C. lancifolia* of Mutis in the *Nova Genera et Species Plantarum* of Humb. Bonpl. and Kunth, and it is probable that they were made acquainted with it only from the drawings of Mutis. The short specific character given in the above work does not distinguish it in the least from their *Condaminea*.

2. *C. cordifolia*, foliis subrotundo-ovatis acutis basi cordatis attenuatisve subtus ramulisque pilosiüsculis supra denudatis nitidis, paniculâ brachiatâ diffusâ pubescente, dentibus calycinis latè-rotundatis mucronulatis, stigmatè bilobo, capsulis oblongo-ovatis cylindricis ecostatis.

*C. cordifolia* Mut. Mss. Humb. in *Magazin*, &c. p. 117. *Rohde Monog.* p. 58. Humb. Bonpl. et Kunth. *Nova Gen. et Spec. Plant.* 3. p. 401 (*exclus. Synonymis omnibus Fl. Peruvianæ, nec non Linn. Syst. Nat. Vahl et Lambert.*) *C. sp. nova vulgo palo blanc Pavon Mss. Quina amarilla Bogotensium.*

Habitat nemora montosa Loxæ in Regno Quitensi Peruvianorum (Pavon) in Regno Novo-granatensi, ubi legit Mutis.

Genitalia inclusa, filamenta plana dilatata antheris linearibus duplo breviora; stigmatibus lobis oblongo-ovatis obtusis.

This species is totally different from the *Cinchona purpurea*, *hirsuta*, and *ovata* (*pubescens* Vahl) of *Flora Peruviana*, which Humboldt and Bonpland in their before-mentioned work have given as synonyms of Mutis's plant. The specimens I possess of it have been examined and named by M. Bonpland while

in England. From the *C. pubescens* (*C. ovata* Fl. Peruv.) of Vahl, with which it has the greatest affinity, it is distinguished by its shorter petioles, by the broader round teeth of its calyx, by the filaments being twice longer, and lastly, by its capsules being smooth and without ribs.

3. *C. rotundifolia*, foliis subrotundis supra denudatis nitidis subtus ramulisque pilosis, paniculâ brachiatâ pubescente, dentibus calycinis brevissimis mucronulatis, stylo exserto, stigmate bipartito, capsulis linearibus teretibus.

*C. rotundifolia*, Pavon Mss.

Habitat in nemoribus in Loxa Quitensium Peruviae. (Pavon.)

Lacinii corollæ ovatis; antheræ filamentis breviores; stigmatibus lobis linearibus planis obtusis.

This is a very distinct species, being easily distinguished from all its congeners by its narrow cylindrical capsules, and by the narrow linear divisions of its stigma.

4. *C. ovalifolia*, foliis ovalibus obovatisve supra denudatis nitidis, subtus ad venas pilosis, dentibus calycinis ovatis acutis, antheris filamentis duplò longioribus, stigmate bipartito, capsulis ovalibus apice constrictis.

(\*) *C. ovalifolia*, Humb. et Bonpl. *Plantæ Æquinoct.* 1. p. 65. t. 19. *EjUSD. Nov. Gen. et Sp. Plant.* 3. p. 403 (exclus. Synon. Mutisii. Humb. in *Magazin*, &c. Vahl et Lambert, nec non Rohde *Monog.*) *C. sp. nova* Pavon Mss.

Habitat nemora montosa ad Loxam in Regno Quitensi Peruvianorum (Pavon); in Andibus Peruviae prope Cuenca (Humb. et Bonpl.).

Paniculâ brachiatâ pubescente; laciniae corollæ lineares; stigmatibus lobis linearibus obtusis.

This plant must not be confounded with the *C. ovalifolia* of Mutis, the *C. macrocarpa* of Vahl, or *Quinquina blanc* of New

c

~~*Cinchona himalaica* Roem. Schult. et DC., non Lambert 21° 8.~~

Granada, which is totally different. *Vide* the remarks I have given on that species.

5. *C. purpurea*, foliis ovalibus ovatisve acutis basi attenuatis utrinque demum denudatis nitidis, paniculâ corymbosâ pubescente, antheris filamentis brevioribus faucem superantibus, stigmatè bilobo incluso, capsulis angustè ovato-oblongis apice attenuatis.

*C. purpurea*, *Fl. Peruviana*, 2. p. 52. t. 193. *C. scrobiculata*, *Humb. et Bonp. Plantæ Equin.* 1. p. 165. t. 47. *EjUSD. Nov. Gen. et Sp. Plant.* 3. p. 402. *Cascarilla fina Bracamorensium. Cascarilla morada, Ruiz Quinol.* p. 67. *Cascarilla bobo de hogamorado.*

Habitat in Andium montibus imis nemorosis et nocte frigidiusculis passim ad Chinchao, Pati, Muna, Casape, Iscutunam, Casapillo et Chihuamocula tractus (Ruiz et Pavon) in Peruviae Andibus, juxta urbem Jaen de Bracamoros (Humb. et Bonpl.).

Capsulæ bisulcæ junioribus pubescentibus demum lævibus.

To this species I have, without hesitation, reduced the *C. scrobiculata* of Humboldt and Bonpland. It is distinguished from the preceding species by its more acute, smoother, and shining leaves; by its corymbose panicles; by its filaments being longer than the antheræ, and these surpassing the faux of the corolla; by the capsules, which are ovato-oblong narrowed, and without ribs; and lastly, by the shorter and broader divisions of its stigma.

6. *C. pubescens*, foliis latè ovatis subrotundo-ovatisve acutis supra longè petiolatis basi rotundatis subacutisve, supra denudatis nitidis, subtus ramulisque piloso-tomentosis, paniculâ brachiato-diffusâ ferrugineo-tomentosis, antheris subsessilibus, stigmatè bilobo, capsulis ovali-oblongis obsoletè costatis tomentosis.

*C. pubescens*, *Vahl in Act. Havn.* 1. p. 19. t. 2. *Lambert*

*Monog. t. 2. C. ovata, Fl. Peruviana, 2. p. 52. t. 195. Cascarillo palido, Ruiz Quinol. p. 74. Vernaculi Cascarillo de Pata de Gallareta.*

Habitat in Andium montibus imis nemorosis calidis versus Pozuzo et Pano (Ruiz et Pavon), et etiam in nemoribus Huanuci Peruvianorum (Pavon Mss.).

Petioli biunciales; dentes calycis brevissimi acuti; laciniae corollae ovatae obtusae; genitalia inclusa; stylus antheras superans; stigmatis lobis ovatis.

7. *C. micrantha*, foliis latè ovalibus obovatisve supra denudatis nitidis subtus in axillas venarum pilosis, paniculâ confertâ pubescente, antheris filamentis brevioribus vix exsertis, stylo brevissimo, stigmate bilobo, capsulis ellipticis apice attenuatis.

*C. micrantha, Fl. Peruviana, 2. p. 52. t. 194. vulgò Cascarillo fino.*

Habitat in Andium montibus altis frigidis et nemorosis, versus vicum Sancti Antonii de Playa Grande, ubi observavit Joannes Tafalla (Ruiz et Pavon.).

Corollae laciniiis ovatis; dentes calycis brevissimi acuti; stigmatis lobis ovatis; capsulae bisulcae ecostatae.

This has some affinity with *C. Condaminea*; but its small flowers and elliptical ecostate capsules, together with its very short style and other marks, readily distinguish it.

8. *C. Humboldtiana*, foliis lanceolatis utrinque acutis supra denudatis subtus ramulisque villosis, paniculâ glomeratâ villosâ, dentibus calycinis brevissimis acutis, antheris sessilibus inclusis, stigmate exserto emarginato, capsulis ovatis hirtis glomeratis.

*C. villosa, Pavon Mss.*

Habitat ad urbem Jaen de Bracamoros, nemora in Regno Quitensi Peruvianorum. (Pavon.)

This is a strongly marked and very distinct species; there is none with which it can be confounded.

9. *C. Pavonii*, foliis orbiculatis cordatisve supra denudatis subtus ramulisque ferrugineo-tomentosis, corymbis ferrugineo-tomentosis, calycibus urceolatis integris absolutè denticulatis, corollæ tubo longissimo, antheris sessilibus, stigmate profundè bipartito, capsulis longissimis teretibus.

*C. cava*, Pavon Mss. vulgò *Canela*.

Habitat in memoribus ad Loxam in Regno Quitensi Peruvianorum. Pavon.

Corymbi confertiflori; corollæ magnæ sericeæ, laciniis ovato-oblongis obtusis carnosis; antheræ inclusæ lineares obtusæ subsessiles, apicibus vix faucem superantibus; stylus inclusus; stigmatis lobis linearibus obtusis margine revolutis; capsulæ longitudine et crassitudine digiti.

This species has considerable affinity with the following. The form of its leaves, its deeply bipartite stigma, its very long cylindrical capsules the size of one's finger, however, widely separate it.

10. *C. macrocarpa*, foliis latè ellipticis obtusissimis subtus ramulisque densè scabrè tomentosis, calyce integro, dentibus prominulis, corollæ ampliatae laciniis lanceolatis apice recurvis, genitalibus inclusis, stigmate emarginato, capsulâ pyriformi tomentosâ.

*C. macrocarpa*, Vahl in *Act. Havn.* 1. p. 20. t. 3. (*exclusis* *Synonymis*) *Lamb. Monog.* p. 22. t. 3. *C. ovalifolia*, Mutis Mss. Humb. in *Magazin, etc.* p. 118. *Rohde Monog.* p. 61. non Humb. et Bonpl. *Plantæ Equinoct. nec Nov. Gen. et Sp. Plant. ejusd.* *Cosmibuena* sp. nova, Pavon Mss. vulgò *Quina blanca, vel Quinquina blanc de Santa Fe*.

Habitat in nemoribus Loxensibus, Huaquilensibus et Cuencensibus (Pavon.); in Regno Novo-granatensi (Mutis.).

Corymbi pauciflori; calyx urceolatus integer; stylus sulcatus.

This belongs to the genus *Cosmibuena* of the *Flora Peruviana*; but, for the want of more distinctive differential generic marks, I have thought best to keep it still united to the genus *Cinchona*. This is certainly the *Cinchona ovalifolia* of Mutis, which, however, must not be confounded with the *C. ovalifolia* of Bonpland, a species totally different: of this Bonpland was well aware in describing his plant in *Plantæ Æquinoctiales*. Professor Kunth more recently, in the *Nova Genera et Species Plantarum*, has been led into an error in considering Mutis's plant the same with that of Bonpland, an opinion which is quite at variance with the figure in *Plantæ Æquinoctiales*, which has not the least resemblance to Mutis's plant, and which Bonpland has there distinctly stated to belong to the genus *Cosmibuena* of the *Flora Peruviana*. The note of Humboldt (with respect to the *C. grandiflora*, *Flor. Peruv.*) at the end of the description in the *Nova Genera et Species Plantarum*, has no reference to the plant there described, but distinctly to the *ovalifolia* of Mutis. The synonyms, therefore, ought to be expunged altogether, as they belong to the present species.

11. *C. Mutisii*, foliis ovalibus utrinque subacutis supra denuatis nitidis subtus ramulisque valdè pilosis, margine undulatis subrevolutis, paniculâ brachiâtâ valdè pilosâ, dentibus calycinis brevissimis mucronulatis, corollæ laciniis ovatis, stigmatibus emarginato, capsulis ovatis cernuis.

*C. microphylla*, Mutis Mss. (*Auct. Zeu.*) *C. quercifolia*, Pavon Mss. *C. glandulifera*, *Fl. Peruviana*, p. 1. t. 224.

β. foliis ovalibus obtusis basi rotundatis subcordatisve.

*C. quercifolia* var. *crispa*, Pavon Mss.

Habitat ad Loxam in Regno Quitensi Peruvianorum. (Pavon.) Antheræ exsertæ filamentis breviores; stylus inclusus.

My specimens of this truly distinct species I submitted to

the examination of my intelligent friend Don Francisco Antonio Zea, who recognised them to be the *Cinchona microphylla*, an unpublished species of Mutis, who gave the Baron de Humboldt a drawing of it when the latter was at Santa Fe. Having never received specimens of the *C. glandulifera* of the *Fl. Peruviana*, I therefore give it as a synonym with considerable doubt.

12. *C. hirsuta*, foliis ovalibus basi acutis ramulisque valdè setoso-pilosis supra venosis demum denudatis, floribus glomeratis setoso-pilosis, laciniis calycinis lanceolatis acuminatis, stigmatibus bilobo, capsulis ovatis.

*C. hirsuta*, *Fl. Peruviana*, 2. p. 51. t. 192. *Cascarillo delgado*, *Ruiz Quinolog.* p. 60.

Habitat in Andium montibus nemorosis, altis et frigidis locis versus Pillao et Acomayo. (Ruiz et Pavon.)

Humboldt and Bonpland, in their often-quoted work, have, on the authority of Zea, referred this species to the *C. cordifolia* of Mutis, with which it has not the least resemblance: this could only be expected from their knowing the plant merely from the figure and description in the *Fl. Peruviana*, without ever seeing specimens of it. Having, therefore, obtained very fine specimens from the author of the *Flora Peruviana*, and which I have shown to Don Zea, he now quite accords with me in considering it a very different species.

13. *C. magnifolia*, foliis latè subrotundo-ovalibus supra denudatis nitidis subtus densè tomentosis, paniculâ brachiato-corymbosâ tomentosâ, dentibus calycinis brevibus acutis, laciniis corollæ lanceolatis, antheris inclusis, stylo exserto, stigmatibus bipartito, capsulis linearibus teretibus.

*C. magnifolia*, *Fl. Peruviana*, 2. p. 52. t. 196. (*non Humb. et Bonpl.*) *Cascarillo amarillo*, *Ruiz Quinolog.* p. 71.

Habitat in Andium nemoribus calidissimis prope torrentes copiosè ad Chinchao, Cuchero et Chacahuassi. (Ruiz et Pavon.)



Laciniis corollæ tubi longitudine ; antheræ limbo multò breviores ; stigmati lobis linearibus obtusis margine revolutis.

The celebrated authors of the *Flora Peruviana* have, in that work, confounded this species with that called by the natives *Flor de Azahar*, the *C. oblongifolia* of Mutis, a very different plant, the bark of which had been first sent to Spain by Don Sebastian Joseph Lopez Ruiz, a physician of Santa Fe de Bogota. M. Bonpland has confounded it with his *C. caduciflora*, which he at first described under the name of *C. magnifolia* of the *Flora Peruviana*; but he very properly altered his opinion afterwards in his note to *C. scrobiculata*, *Plantæ Æquinoct.* 1. p. 167. The present species differs from Bonpland's plant by the form of its leaves, by the acute teeth of its calyx, by its larger corolla, whose lanceolate laciniæ are equal to the length of the tube ; by the anthers being inclosed in the tube ; by the style being exserted ; and especially by its linear cylindrical capsules.

14. *C. caduciflora*, foliis latè obovatis basi acutis supra denudatis nitidis subtus ad axillas venarum pilosis, paniculâ brachiata pubescente, dentibus calycinis ovatis obtusis, laciniis corollæ lineari-oblongis, antheris parùm exsertis, stylo brevissimo, stigmatibus bipartito, capsulis ovali-oblongis.

*C. caduciflora*, Bonpl. in *Plantæ Æquinoct.* 1. p. 167. Humb. Bonpl. et Kunth. *Nov. Gen. et Sp. Plant.* 3. p. 402. *C. magnifolia*, Humb. et Bonpl. *Fl. Æquinoct.* 1. p. 136. t. 39. (*exclus. Synon. Fl. Peruv.*) *Cascarilla bova Peruvianorum.*

Habitat in Peruviae Andibus juxta urbem Jaen de Bracamoros. (Humb. et Bonpland.)

Corollæ laciniis tubo brevioribus ; stigmati lobis linearibus planis.



15. *C. oblongifolia*, foliis oblongis cordatisve utrinque ramulisque densissimè scabrè pilosis, paniculâ brachiato-corymbosâ scabrè pilosâ, laciniis corollæ pilosæ linearibus, genitalibus inclusis, antheris filamentis triplò longioribus, stigmate bipartito, capsulis ovatis.

*C. oblongifolia*, Mutis Mss. Humb. in Magazin, etc. p. 118. Rohde, Monog. p. 57. (exclus. Synonym. Fl. Peruv.) Humb. Bonpl. et Kunth. Nova Gen. et Sp. Fl. 3. p. 401. (exclus. Synonym. Fl. Peruv. et Ruiz Quinalog.) vulgò Quina roga *Cinchona* vulgò Azahar, Pavon Mss.

Habitat nemora in montibus Loxæ Peruvianorum (Pavon) prope Maraquitá Novo-Granatensium. (Humb. et Bonpland.)

This plant is certainly very distinct from the *C. magnifolia* of *Flora Peruviana*. It is distinguished from it by its leaves being rounded at the base, often cordate, covered on both sides with rough pilose tomentum, sometimes the older leaves, however, become nearly naked above; the corolla is covered on the outside with bristly pilose hairs, while that of *magnifolia* has short pubescence; the laciniæ are also much narrower; the style is inclosed with the stamens in the tube of corolla; the lobes of the stigma are cylindrical, and the capsules are ovate: those of *magnifolia* are linear and cylindrical. All these characters are constant in all the specimens I possess of both species, and I therefore think myself justified in separating them, although I am extremely unwilling to be at variance with so high authority as Humboldt justly is.

16. *C. acutifolia*, foliis lanceolatis acuminatis supra denudatis nitidis ad venas pilosis, laciniis calycis lineari-oblongis obtusis, laciniis corollæ linearibus acutis, genitalibus inclusis, stigmate bipartito, capsula pyriformi hirsutâ basi attenuatâ.

*C. acutifolia*, *Fl. Peruviana*, 3. p. 1. t. 225. *Cascarillo de hoja aguda*, Ruiz et Pavon *Supplem. Quinolog.* p. 8.

Habitat in Peruviae Andium nemoribus imis ad Chicoplaya fluvium, Taso dictum. (Ruiz et Pavon.)

Panícula brachiata, densè pilosa; stigmatibus lobis linearibus, obtusis.

17. *C. stenocarpa*, foliis lanceolatis utrinque acutis supra denudatis subtus ad venas pilosis, dentibus calycinis ovatis acutis, antheris sessilibus, stylo brevissimo, stigmate emarginato, capsulis linearibus teretibus.

*C. sp. nova*, Pavon *Mss.*

Habitat nemora juxta urbem Jaen de Bracamoros in Regno Quitensi Peruvianorum. (Pavon.)

Panícula diffusè ramosissima pubescens; laciniae corollae lineares obtusae.

Facies *C. Condamineae*, at diversissima.

18. *C. dichotoma*, foliis ellipticis breviter acuminatis utrinque demum denudatis basi acutis; junioribus sericeis, pedunculis terminalibus dichotomis paucifloris, dentibus calycinis brevissimis, capsulis linearibus longissimis teretibus.

*C. dichotoma*, *Fl. Peruviana*, 2. p. 53. t. 197.

Habitat in Andium nemoribus versus Pueblo Nuevo in Chicoplaya tractibus, ubi Joannes Tafalla speciem detexit, et inde exemplaria sicca nobis anno 1797 misit. (Ruiz et Pavon, loc. cit.)

All the specimens of this remarkable species of *Cinchona*, sent by Don Juan Tafalla to the authors of the *Flora Peruviana*, appear to have been fruit-bearing ones only, so that its flowers still remain unknown; and on that account I am doubtful whether it belongs to this section. My specimens agree exactly with the excellent figure in the above work.

19. *C. grandiflora*, foliis obovatis obtusissimis utrinque petiolisque denudatis nitidis, corymbis paucifloris glaberrimis, dentibus calycinis ovatis acutis, corollæ tubo ampliato, antheris sessilibus inclusis, stigmatē bilobo, capsulis elongatis teretibus.

*Cinchona grandiflora*, *Fl. Peruviana*, 2. p. 54. t. 198. *Cosmibuena obtusifolia*, *ejusd. oper.* 3. p. 3. t. 198.

Habitat in Andium nemoribus calidissimis Peruviae, affatim ad Pozuzo fluvii margines (Ruiz et Pavon.); etiam ad novum vicum Pueblo Nuevo de S. Antonio de Chicoplaya.

Corollæ laciniis latè ovatis, planis, carnosis; antheræ lineares; stylus exsertus, stigmatis lobis ovatis, obtusis, crassis; capsulae nudæ.

This is the *Cosmibuena obtusifolia* of the third vol. of *Flora Peruviana*. It is widely different from the *C. macrocarpa* of Vahl, the *C. ovalifolia* of Mutis, with which Humboldt, in his account of the Bark Forests, appears to have confounded it. The flowers are of a brilliant white, the largest of the whole genus, which, together with its green shining leaves, form a striking contrast in its native forests. It delights in the warmest regions of Peru.

20. *C. acuminata*, foliis ovatis breviter acuminatis utrinque petiolisque denudatis nitidis, floribus terminalibus subsolitariis, dentibus calycinis oblongo-ovatis obtusiusculis, corollæ tubo longissimo angustato, genitalibus parum exsertis, stigmatē bilobo, capsulis oblongis cylindricis.

*Cosmibuena acuminata*, *Fl. Peruv. et Chilen.* 3. p. 4. t. 226.

Habitat in Peruviae Andium nemoribus imis, ad Chicoplaya tractus, unde Joannes Tafalla specimina sicca nobis anno 1798 misit. (Ruiz et Pavon loc. cit.)

Corollæ laciniis latè ovatis; antheræ lineares, sessiles; stigmatis lobis oblongis, crassis, obtusis.

21. *C. rosea*, foliis lanceolato-ovatis utrinque acutis denudatis nitidis, paniculâ confertâ, calycibus integris denticulis obsoletis, laciniiis corollæ latè ovatis, filamentis basi barbatis, antheris sphericis! exsertis, stigmatè emarginato incluso, capsulis ovatis bisulcis glabris.

*C. rosea*, *Fl. Peruv. et Chilens.* 2. p. 54. t. 199.

*C. Tarantaron*, *Pavon Mss.* *Cascarilla Pardo*, *Ruiz. Quinolog.* p. 77.

Habitat in Andium nemoribus imis, copiosè ad Pozuzo et S. Antonii de Playa Grande tractus. (Ruiz et Pavon.)

Notwithstanding the very accurate figure of this plant in the *Flora Peruviana*, Humboldt, on the authority of Zea, has been led to join it with the *Cinchona lancifolia* of Mutis, with which it has not the least affinity, and forms one of the most distinct and strong-marked species of the whole genus. The corolla is quite smooth; its filaments are long, and bearded towards the base: but what is the most striking character of all, is its spherical antheræ, which no other genuine *Cinchona* yet known possesses. My friend Don F. A. Zea, to whom I showed my specimens of it, and who had never before seen any, agrees with me in regarding it as a species widely remote from the *C. lancifolia* of Mutis. The description in *Flora Peruviana* states the laciniae of the corolla as being hairy at the margin; this circumstance is not evident in the figure, neither can I find the least trace of it in my specimens.

22. *C. triflora*, foliis lanceolatis obtusis utrinque ramulisque glaberrimis nitidis basi attenuatis, corymbis compositis tenuifloris, pedunculis 3-2-floris, dentibus calycinis subulatis, corollæ tubo longissimo filiformi: laciniiis angustè linearibus longis dependentibus, capsulis obovatis.

*C. triflora*, *Wright in Edinb. Med. Journ.* p. 240.

Habitat in insulâ Jamaicâ, Wright et Wiles.

This belongs to the section of Island *Cinchonæ*, which perhaps ought to form a distinct genus. It is a native of Jamaica, where it was first discovered by the late Dr. Wright of Edinburgh, an indefatigable botanist, who ascertained it to be a distinct species, and afterwards described it in the Edinburgh Medical Journal, under the name of *C. triflora*, from the peduncles being mostly three-flowered. I possess excellent specimens of it both in flower and fruit, which agree in every respect with those I have received from Dr. Wright himself. The *C. floribunda* of Swartz, with which it has the greatest affinity, differs from it by the leaves being ovato-elliptical acuminate, not attenuated at the base; the corymbs of flowers are also much larger and closer; the teeth of the calyx shorter and broader; the tube of the corolla is much shorter and wider; and the capsules oblong cylindrical.

---

Números  
de la liste autographe  
de Paven, au Musée  
Britannique.

## LIST OF BARKS.

Bark	Escorcos
16.	1
41 37	2
	3
	4
25	5
34	6
	7
	8
	9
35	10
	11 et 51.
15	12
11.	13
	14
3	15
17	16 et 53
	17
30	18
13.	19
	20
36.	21 et 46.
10.	22
	23
24.	24
	25

1. Cinchona vulgò Azaharito de Loxa.
2. ——— Cascarilla crespilla de Jaen de Loxa.
3. ——— Cascarilla fina de Loxa.
4. ——— Cascarilla de Quiebro de Cuenca de Loxa.
5. ——— Tarantaron de Loxa.
6. ——— Puchon de Loxa.
7. ——— Flor de Azahar.
8. Cinchona rosea del Peru.
9. ——— con hojas rugosas de Loxa.
10. ——— con hojas de Lucuma de Loxa.
11. ——— Quina crespilla de Loxa.
12. ——— Margarita de Loxa.
13. ——— con hojas de Roble de Loxa.
14. ——— laccifera del Peru parecida á la Roxa, de Mutis.
15. ——— Azahar macho de Loxa.
16. ——— Pata de Gallinano, vulgò de Loxa.
17. ——— Provincia, vulgò de Loxa.
18. ——— Azahar hembra, vulgò de Jaen de Loxa.
19. ——— Cascarilla crespilla ahumada de Loxa.
20. ——— Cascarilla colorada de Jaen de Loxa.
21. ——— Cascarilla amarilla de Quito Loxa.
22. ——— Cascarilla crespilla de Latuna de Loxa.
23. ——— Quina parecida á la amarilla de Mutis.
24. ——— Quina crespilla parecida á la buena de Loxa.
25. ——— Quina con hojas un poco vellosas de los Azques (azques, marchés)  
de Loxa.

26	26.	Cinchona Cascarilla o Quina de Nagenal de Loxa.	
27	27.	_____ serrana de Huaranda Loxa.	
29	28.	_____ con hojas de Palton de Loxa.	
30	29.	_____ con hojas redondas de Quiebro de Loxa.	
31	30.	_____ <u>bola</u> del Peru.	(boba)
33	31.	_____ Quina colorada del Rey de Loxa.	
35	32.	_____ Quina amarilla fina del Rey de Loxa.	
32	36	33. _____ Cascarilla chauerguera de Loxa.	
	37	34. _____ Quina negra de Loxa.	
46	35.	_____ amarilla de Quito de Loxa.	
4	48	36. _____ con hojas de <u>Lambo</u> de Loxa.	(Lambo)
12	49	37. _____ estopara de Loxa.	
	50	38. _____ blanca Pato de Gallinaso de Loxa.	(estopara)
5	39.	_____ Cascarilla colorada de los <u>Azques</u> de Loxa.	(azques)
6	40.	_____ colorada de Loxa.	
26	41.	_____ amarilla Uritusinga.	
31	42.	_____ crespilla mala de Macos de Loxa.	
33 ?	43.	_____ Provinciana fina de Jaen de Loxa.	
29	44.	_____ amarilla del Rey de Loxa.	

ON THE  
CINCHONA FORESTS OF SOUTH  
AMERICA.

---

BY A. VON HUMBOLDT.

---

SECTION I.

THE present Essay is written with a view to examine the Cinchona tree as an object of physical or botanical geography. Amongst the numerous writers mentioning the Cinchona, there are none but La Condamine, Ruiz, Pavon, and Zea, who themselves have observed this beneficial tree upon the South American continent. Only the first of these gives a physical description of this plant; the others, as well as Jacquin and Swartz, who saw the Cinchonæ in the West-India Islands, and Vahl and Lambert, who occupied themselves with dried specimens, have merely treated on the natural history and the botanical diagnosis. During my stay of four years in South America, I had occasion to reside a long time in countries where the Cinchona trees are indigenous. M. Bonpland and myself have observed them north and south of the equator, in the kingdom of New Granada, betwixt Honda and Santa Fe de Bogota, in the province of Popayan, in the corregiment of Loxa, on the Amazon river, in the province of Jaen de Bracamoros; and in the northerly part of Peru. During our abode in the house of Don Jose Celestino Mutis, in Santa Fe, the botanical treasures of that great natural philosopher were opened to us. In Spain,



also, we were enabled to collect, from the editor of the *Flora Peruviana*, in Guayaquil, (the harbour of Quito on the coast of the South Sea) from M. Tafalla, a pupil of Ruiz, in the little town of Loxa, from Don Vincente Olmedo, royal inspector of the Cinchona forests, many interesting accounts respecting objects which, but for the obliging communications from those friends, would have remained unknown to us. Respecting the very violent controversy on the question, whether the orange-coloured Cinchona bark of New Granada, or the Peruvian *Cinchona nitida*, described by Ruiz and Pavon, be identical with the genuine Cinchona of Uritusinga, famed already since 1638, he only can decide who has himself explored the regions producing these three plants. But of the contending parties, neither Mutis, Zea, nor Ruiz and Pavon, have ever set their feet in the corregiment of Loxa. Thence it is, that each party has, with equal want of foundation, asserted that the most efficacious Cinchona bark of their respective districts was the genuine one from Uristusinga. In the second fasciculus of our *Æquinoctial Plants*\* we have shown, that this latter, the *Cascarilla fina de Loxa*, is entirely different from *Cinchona lancifolia* of Mutis, and from all those Peruvian Cinchona barks described in Ruiz's *Quinologia*, in the *Flora Peruviana*, and in the recent *Supplement* to the *Quinologia*. Averse as we are from entering into competition with the above-named excellent botanists, yet the accidental advantage has fallen to our lot, of having ourselves seen the Cinchona forests near Santa Fe, as also those of Loxa. In fact, for the last sixty years, since the time of Joseph de Jussieu, whose observations were moreover never published, no travelling naturalist has preceded us in visiting the beautiful mountain plains of Loxa. Favoured by these circumstances, I think myself enabled to speak with

\* Plantes Æquinoctiales, par Messrs. Bonpland et Humboldt. Troisième livraison, p. 39.

some confidence on so difficult a subject, which, by a variety of controversies, has become more and more perplexed.

It would be superfluous to repeat the fictions concerning the history of the discovery of the medicinal powers of the Cinchona bark. Some say a patient had drank out of a lake the waters of which had acquired a bitter taste from Cinchona trunks which had lain in them; others, that a lion had cured himself of the ague by chewing Cinchona bark, and had thus directed the attention of the Indians to this tree. Lambert, in his *Mono-graph of Cinchona*,\* has collected all these opinions. That animals have taught men, is a very common form of the traditions of nations. The valuable antidote *Vijuco del guaco*, a plant described by Mutis, which is related to the *Mikania*, and has been erroneously confounded with the *Ayapana* of Brazil, is also said to have attracted the notice of the Indians (as is affirmed of the *Falco serpentarius*) by the *Falco guaco* of New Granada fighting with serpents. However, that the great American lion without mane, *Felis concolor*, should be subject to the ague, is just as bold an hypothesis as the assertion of the inhabitants of the pestilential valley Gualla Bamba,† that even the vultures (*Vultur aura*) in their neighbourhood were subject to that disorder. Indeed, in the regions of the Cinchona forests there is not even a *Felis concolor* so fond of warmth to be found; but at the most the cat *Puma*, not yet properly described, (*La Condamine's Petit lion du volcan de Pinchincha*, which I should be inclined to call *Felis andicola*,) and which we have met with in heights of 2,500 toises.

The story, so often copied, respecting the Countess Chinchon, vice-queen of Peru, is probably still more doubtful than it is generally supposed to be. There certainly was a Count Chin-

\* A Description of the Genus Cinchona, 1792, p. 39.

† Near to the town of Quito.

chon, Don Geronimo Fernandez de Cabrera Bobadella y Mendoza, who was Viceroy in Lima from 1629 to 1639. It is very probable that his wife, after her return to Spain in 1640, was the first who introduced the Cinchona bark into Europe. The name of *Pulvis Comitissæ* appears even more ancient than that of *Pulvis Jesuiticus* or *Pulvis Patrum*. But I do not believe (and M. Olmedo in Loxa is of the same opinion with me) that the corregidor of Loxa, Don Juan Lopez de Cannizares,\* who is said to have cured the Countess of the ague, received this remedy from the Indians. In Loxa there is no tradition whatever of this kind; nor is it probable that the discovery of the medicinal power of the Cinchona belongs to the primitive nations of America, if it is considered that these nations (like the Hindoos) adhere with unalterable pertinacity to their customs, to their food, and to their nostrums, and that, notwithstanding all this, the use of the Cinchona bark is entirely unknown to them in Loxa, Guancabamba, and far around. In the deep and hot valleys of the mountains of Catamago, Rio Calvas, and Macara, agues are extremely common. But the natives there, as well as in Loxa, of whatever cast, would die rather than have recourse to Cinchona bark, which, together with opiates, they place in the class of poisons exciting mortification. The Indians cure themselves by lemonades, by the oleaginous aromatic peel of the small green wild lemon, by infusions of *Scoparia dulcis*, and by strong coffee.† In Malacatis only, where many bark-peelers live, they begin to put confidence in the Cinchona bark. In Loxa there is no document to be found which can elucidate the history of the discovery of the Cinchona: an old tradition, how-

\* Flora Peruviana, tom. ii. p. 2.

† Among the Indians on the Orinoco, particularly in Atures and Maypura, we have found an excellent febrifuge, the *fruta de Burro*, the fruit of a new species of *Ucariæ*, which we have described by the name of *Ucariæ febrifuga*.

ever, is current there, that the Jesuits at the felling of the wood had distinguished, according to the custom of the country, the different kinds of trees by chewing their barks, and that on such occasions they had taken notice of the considerable bitterness of the Cinchona. There being always medical practitioners among the Missionaries, it is said they had tried an infusion of the Cinchona in the tertian ague, a complaint which is very common in that part of the country. This tradition is less improbable than the assertion of European authors, and among them the late writers Ruiz and Pavon, who ascribe the discovery to the Indians. The medicinal powers of the Cinchona was likewise entirely unknown to the inhabitants of the kingdom of New Granada.

A century elapsed before any botanical description was obtained of the tree whose pulverized bark yielded the Jesuit's Powder. The astronomer La Condamine, who ranged with indescribable vivacity through all departments of human knowledge, and by whom there are several neat botanical drawings in the collection of Jussieu in Paris, was the first man of science who examined and described the Cinchona tree. In the year 1737\* he travelled through Loxa to Lima, and his description of the Cinchona appeared in 1738 in the *Mem. de l'Academie*. Afterwards, in the year 1739, Joseph de Jussieu explored the country in the vicinity of Loxa. There, and in the neighbourhood of Zaruma, he gathered a great number of specimens, which are still to be found in Jussieu's collection at Paris, and which we have compared with our own, collected sixty years later on the same spot. Amongst these was the *Cinchona pubescens*, which Vahl has described as new, but which, as we shall subsequently prove, is the first *Cinchona officinalis* of Linné's *Systema Naturæ* (12th edition). In the year 1743 La Con-

\* Voyage à l'Equateur, p. 31, 75, 186, and 203.

damine was a second time in Loxa, from whence he travelled, as we did in the year 1802, to Tomepinda and the Amazon river. At that time the first and (what is singular enough) the last attempt was made to bring young Cinchona trees alive to Europe. After the astronomer had carefully nursed them for eight months during a passage of 1200 leagues, they were swallowed up by a wave, which washed over the boat, near Cape Orange, north of Para.

Botanists for a long time were acquainted with only one species of Cinchona, which Linnæus called *officinalis*, and in the description of which, he united, without knowing it, our *C. Condaminea* and *C. cordifolia* Mutis; for the specimen sent him from Santa Fe was yellow Cinchona, and totally different from that drawn, though imperfectly, by La Condamine. At last Jacquuin's voyage made us acquainted with another species, viz. the *C. caribæa*. The West India Islands, the South Seas, even the East Indies, offered from time to time more species of Cinchona to the traveller, but the most efficacious and the most remarkable ones of the continent of South America remained longest unnoticed.

From 1638 to 1776 no other Cinchona bark was met with in commerce, except that of the corregiment of Loxa and its neighbourhood. La Condamine makes mention of the bark from Riobamba and Cuenca in the province of Quito, as also of that from Ayavanca and Jaen de Bracamoros. But the bark from the interior of Peru (around Huanuca, and in the province La Paz) or even the bark from the kingdom of New Granada was entirely unknown to him.

They did not suppose it possible for Cinchona trees to exist north of the Equator, and consequently in our hemisphere, till a fortunate accident led a man, who had a long time lived in

Loxa, in some department connected with the peeling of barks, on his return to Spain, across Popayan to Santa Fe de Bogota. This observing traveller was the upper Mint Director (*Superintendente general de moneda de Santa Fe*) Don Miguel de Santistevan, who, without any botanical knowledge, discovered physiognomically, that is to say, by mere habitus, the Cinchona trees from Loxa up to  $2\frac{1}{2}^{\circ}$  N. lat. In a memorial concerning the royal administration of the whole trade of Cinchona bark (*Estanco de Cascarilla*) which in 1753 he addressed to the viceroy Marquis de Villar, he expressly says that he had found Cinchona trees not only betwixt Loxa and Quito, for instance, easterly from Cuenca near the villages Paute and Gualasco, westerly from Riobamba on the declivity of the Chimborazo near Angas, and on the Cuesta de S. Antonio, but also betwixt Quito and Santa Fe in all situations, where the ground is of an equal height with Loxa, consequently 800 toises above the level of the sea. The estimate of the height according to modern measurements, and even according to the earlier ones of La Condamine,\* is certainly too low by at least 250 toises; but the acute observation, respecting the mean height in which the Cinchona trees are always met with on the mountainous declivity, is the more striking, since even learned philosophers at that time paid attention to the geography of plants, or to the height of their situation. It is also to be observed, that although M. Santistevan, according to the manuscript accounts which I procured of him, speaks generally of Cinchona trees betwixt Quito and Santa Fe, yet we can perceive from his enumeration of particular places, that he discovered this precious produce only in the valley of Rio Tuanamba north of Pasto, in the forests of Beruccos, and in the vicinity of Popayan, near Guanacas, the dangerous pass of

\* Voyage de la Rivière de l'Amazonne, p. 25.



the Andes, betwixt the village of this name and the Sitia de los Corrales.

Such was the state of the discovery of Cinchona north of the equator until the year 1772. All the Cinchona bark of commerce was from Loxa, Gauancabamba, and Jaen, perhaps even from Riobamba and Cuenza. The whole was shipped at the ports of the Pacific. No advantage was derived from the important discovery in the provinces of Pasto and Popayan. In the year 1772 Don Jose Celestino Mutis discovered the Cinchona about Santa Fe, and since this epoch Europe received Cinchona bark which did not double Cape Horn, and which came by way of Carthagena de Indias to Cadiz.

M. Mutis had resided already twelve years in the kingdom of New Granada. He had travelled twice through the forests between Guaduas and Santa Fe, where the Cinchona tree is surrounded by the beautiful Granada oaks. If we consider the diversity of plants which engage the attention of the botanist in these countries; if we reflect that in the tropics the height of the trunks withdraws from our eyes both leaves and blossoms; we shall be the less surprised that M. Mutis discovered the Cinchona only in 1772, when he found it in blossom. This excellent explorer of nature, who is a native of Cadiz, studied three years in Madrid, and was induced by a love of botany to accompany the viceroy Don Pedro Misia de la Cerda, as his physician, to Santa Fe. He lived a long time in the districts of Pampelona and de la Montuosa, a name which, to the greatest dissatisfaction of M. Mutis, Linnæus has construed into Mexico; so that this Swedish botanist has quoted all the New Granada specimens which he received from la Montuosa, as Mexican ones.\* This error is the more singular, since Linnæus, who corresponded with Mutis always by way of Carthagena de Indias, must have

\* For instance, *Mannettia reclinata*.

perceived that he never resided in Mexico. The absence of M. Mutis in the mines north of Santa Fe had kept him far from the Cinchona forests of Mave, Gascas, and the Aseradero. Mutis, in a report to the viceroy Don Manuel Antonio Florez, alleges as a ground of the later discovery of the Cinchona, that up to 1772 he had directed all his botanical excursions out of the limits of the first 5 degrees of N. lat., which he held to be the exclusive country of the Cinchona in the northern hemisphere. This great naturalist did not at that time suspect, that soon afterwards the Cinchona tree would be found to exist even at the mouth of the Rio Opon, and as far as Santa Martha, consequently in the 10th degree of N. lat.

Mutis had procured the first dried specimens of the yellow Cinchona of Loxa (*C. cordifolia*) from M. Santistevan, director of the Mint. According to these, the genus *Cinchona* was established in such manner as he communicated it to Linnæus. In the year 1772, when M. Mutis, in company with his friend Don Pedro Ugarte, rode through the forest of Tena, not far from the mountainous declivity of Santa Fe, he discovered Cinchona trees. A year afterwards he also found them betwixt Honda and Guaduas; and presented to the viceroy Don Manuel de Guirior, who had just embarked on the Magdalen river, a flowering branch of Cinchona, as a newly-discovered valuable product of that country, which nature had also enriched with aromatic Nutmegs (*Myristica Otoba*), with an excellent Cinnamon tree (*Laurus cinnamomoides* Mut.) with aromatic *Puchery* or *Todaspue* (*Laurus\* Putseri* Mut.), with Almonds (*Caryocar amygdaliferum* Mut.), with four kinds of *Styrax*, with the Bal-

\* The *Laurus Putseri* of Mutis is the same as the *Laurus Pucheri* of *Fl. Peruviana*, vol. iv. t. 352, ined. The number of species of this genus figured in the fourth vol. ined. of the *Flora Peruviana*, amounts to thirty. The fruit of the *Laurus Pucheri* is frequently sold in the London shops under the name of Sassafras nuts. *Caryocar amygdaliferum*, *Fl. Peruv.* vol. v. ined. t. 470, *Myrospermum balsamiferum*, *Fl. Peruv.* 4, ined. t. 373.



sam of Tolu (*Toluifera\* indica*), with a Tea tree (*Alstonia theaformis* Mut.), with Ipecacuanha (*Psychotria emetica* Mut.), with Wax-palms (*Ceroxylon andicola* Humb.), with Carannia gum (*Eginetia cannifera* Mut.), with Winter's bark (*Wintera granadensis*), with *Quassia simarouba*, and with the valuable dyeing woods.

In the history of sciences, it often happens that the person who knows how to diffuse, with a certain degree of boldness, the discovery of another, passes for the discoverer himself, instead of him who made that discovery. M. Mutis, a man of a liberal and enlightened mind, asked no reward from the Government. He occupied himself without ostentation in botanical examinations of the kinds of Cinchona which he discovered, and in the application of their barks through an extensive medical practice. In the year 1783 only, he obtained a royal salary, when the botanical expedition of Santa Fe was organized by M. Gongora, who was both archbishop and viceroy.

In the year 1776, four years after M. Mutis's discovery, Don Sebastian Jose Lopez Ruiz, a cunning and petulant physician at Santa Fe, a native of Ganama, found means to persuade the Spanish Government that he had first discovered Cinchona trees in New Granada. He sent samples of the new Cinchona to Madrid, spoke a great deal of the importance of this new article of commerce, and obtained a yearly pension of 2000 piastres for his reward. From records which M. Lopez remitted to me in the year 1802, by his brother, a canon in Quito, in order to prove to me the priority of his discovery, I have found that he knew the Cinchona about Honda only in the year 1774, and that he made the first medicinal experiment with it in the year 1775. M. Lopez did not long enjoy his full salary. The viceroy Gongora, who besides esteemed M. Mutis greatly, and his first secretary Don Zenon de Alonzo, who was a zealous pro-

\* *Myrspermum balsamiferum*.

moter of the sciences, represented to the Court, that M. Lopez was not the first discoverer of the New Granada Cinchona bark. They immediately withdrew one half of the royal pension, ordered M. Lopez to travel to the Darien, where it was also pretended that Cinchona had been discovered; and as he refused to undertake a journey to such a pestilential climate, the viceroy discontinued the other half of his salary. Since this epoch a violent dispute has arisen respecting the priority of the discovery. Lopez made a voyage to Europe, and again contrived to procure for himself a salary of 1000 piastres. He ingratiated himself with M. Mutis's botanical opponents, and these have mentioned him frequently since as co-discoverer. It is still more remarkable, that Colonel Don Antonio de la Torre Miranda wishes to prove, in his Topography of the province of Carthagena, (*Noticia individual de los Poblaciones nuevas fundadas en la Provincia de Carthagena*), by means of testimonies, that to him belongs the honour of discovering the Cinchona bark in New Granada, because in the year 1783 (consequently eleven years after M. Mutis) he had discovered it near Fusagasuga. M. Mutis had begun, in Mariquita, a plantation of Cinchona and of Cinnamon\* of the Andaquia Missions, the remains of which we also saw. In the year 1800 the Spanish Government commissioned a French physician, M. Louis Dericieux, to continue these plantations; to cultivate the indigenous *Myristica*,† and to superintend generally the packing of the Cinchona bark in New Granada. He received a salary of 2000 piastres, with the title of *Comissionado y Encargado de Investigaciones de Historia Natural en el Nuevo Reyno de Granada*. He possessed as little botanical knowledge as M. Lopez, but was a man of strong mind and intellectual capacity. He had long before lived in Santa Fe, from whence he

\* *Laurus cinnamomoides*, Mutis.—Edit.

† *Myristica otoba*, Humb. et Bonpl. *Plantæ Æquin.* 2, p. 78, tab. 103.—Edit.

was dragged in chains to Carthagena, and thence to a prison in Cadiz, under the false accusation of revolutionary principles. After his innocence had been acknowledged, the Minister of State Don Mariano de Urquijo conferred on him the superintendence of the Cinchona forests. I travelled with him upon the Magdalen River, during which time his amiable son made several drawings of plants for me. The father stepped forth betwixt M. Mutis and M. Lopez. As the specific characters of the species of Cinchona excited the bitterest disputes between Zea, Ruiz, and Pavon, at Madrid, so the Cinchona bark, ever since its first discovery, has been an odious object of persecution in Santa Fe. I have learned with great regret, that soon after I left South America, M. Derieux had lost his salary, and had even been compelled to leave the vice-royalty, so that the Cinchona trees again grow without any superintendence, which, indeed, has hitherto not promoted their increase or preservation.

In this simple historical narrative we have shown, that till the year 1772 all Cinchona bark was collected in the forests of Loxa, Ayavaca, and Jaen de Bracamoros, consequently between the 3rd and 5th degrees of south latitude, and that only from the year 1772 the medicinal Cinchonæ on the South American continent became used in the northern hemisphere; which species of Cinchona were discovered between the 4th and 5th degrees of south latitude. Until then, none were known in Peru Proper, especially in the mountains situated nearer to Lima, the capital. The vale of Rio Calvas, and the village Ayavaca, in whose neighbourhood the *Cinchona Condaminea* grows, famed since the year 1738, belong indeed in a political respect to Peru, but both are situated close to the confines of the corregiment of Loxa; and the bark of Ayavaca, like that of Jaen, was sold by the name of *Cascarilla fina de Uritusinga*, as well as that which was shipped in Payta.

It was only in 1776 that the real commerce in Peruvian Cinchona bark began. Don Francisco Renquifo discovered near Huannuco, on the mountain San Christo val de Cuchero, the *C. nitida* of Ruiz, a species very nearly related to the orange-coloured one of Mutis (*Cinchona lancifolia*). An enterprising man, Don Emanuel Alcarraz, brought the first sample of it to Lima, and turned the use of it to advantage. The editors of the *Flora Peruviana* did certainly not penetrate, in 1779, as far as the Amazon River itself, but only to those rivers which flow immediately into it. They visited the beautiful valleys of Tharma, Xauxa, and Huamalies, and in 1779 determined the botanical characters of the North Peruvian species. This was consequently seven years after M. Mutis began his labours on the Cinchonæ of New Granada. Shortly afterwards, medicinal Cinchona bark was discovered at almost one and the same time in the most northern and in the most southern part of South America, in the mountains of Santa Martha, and in the kingdom of Buenosayres, near La Paz and Cochabamba, where a naval officer, Rubin de Celis, and the German botanist Taddæus Haenke, drew the attention of the inhabitants to this valuable produce.

After the year 1780, therefore, Europe was superabundantly supplied from the ports of Payta, Guayaquil, Lima, Buenosayres, Carthagena, and Santa Martha, with Barks of various medicinal powers. Of these barks, some went direct to Spain, and some were transmitted by the smuggling trade to North America and England. West-Indian Cinchona barks were also occasionally mixed with those of the continent. They gave the name of Cinchona to barks which indeed possess great febrifuge powers, but which are derived from trees which do not even belong to the genus *Cinchona*. Thus they spoke in Cadiz of *Cascarilla* or *Quina de*

*Cumana* and of *Quina de la Angostura*. They divided all bark into genuine and into spurious, without considering, that, although true Cinchona barks possess equal medicinal power, yet that they are capable of displaying specific differences in the manner of their efficacy. They asked for bark like that of Loxa, without considering that three or four kinds of Cinchona bark had ever since 1738 come from Loxa itself to Europe, which were the produce of quite different species of Cinchona. They forgot that the quality of the bark did not depend merely on its being from the *C. lancifolia* or from *C. macrocarpa*, but that locality of growth, the age of the tree, quick or slow drying, determine its efficacy. They mistook the same species, if the bark was, instead of *canutillos*, *i. e.* in thin quills, in thick *cortizones*, or even powdered. They mixed, sometimes through mistake, sometimes intentionally, the bark of *Wintera granadensis* and of the tanning *Weinmannias*, with the Cinchona bark, and even stained them with an infusion of Brazil wood.

These circumstances gave rise to very singular prejudices in judging of Cinchona bark. Certain mercantile houses in Spain, which half a century since were in possession of the exclusive trade in Cinchona bark, endeavoured to throw disrepute on that from New Granada and southern Peru. They found complaisant botanists, who, by boldly exalting varieties to species, proved that all Peruvian Cinchonæ were specifically different from those which grow about Santa Fe. Physicians, like the Popes, drew lines of demarcation on the map. They insisted, that beyond a certain degree of latitude in the northern hemisphere no efficacious Cinchona could grow. But as the commerce with Cinchona bark from Huamalies and Huanuco, which Ortega, Ruiz, Pavon, and Tafalla recommended, soon fell into the hands of those who had formerly carried on the South Sea trade in the

Cinchona bark of Loxa, the new Peruvian Cinchona barks naturally gained easier access into Spain than those from Santa Fe. The latter, on the contrary, which the English and North Americans could easily procure in Carthagena, as a port more accessible to the smuggling trade, obtained a preferable fame in London, Germany, and Italy. The effect of mercantile cunning went so far, that, at the royal command, a quantity of the best orange-coloured Cinchona bark from New Granada, which M. Mutis had caused to be peeled at the expense of the king, was burned, as a decidedly inefficacious remedy, at a time when all the Spanish field-hospitals were in the greatest want of this valuable product of South America. A part of the Cinchona bark condemned to destruction was secretly bought by English merchants in Cadiz, and publicly sold in London at high prices. Since M. Zea, the present director of the botanic garden at Madrid, has maintained, in the *Annales de Ciencias Naturales*, against the editors of the *Flora Peruviana*, that their Peruvian species of Cinchona are identical with those of M. Mutis, but that they have described one and the same species under two or three names, the dispute concerning the quality of Cinchona bark from Santa Fe has again become very animated. The Supplement of the *Quinologia*, by Ruiz and Pavon, is written with a bitterness which ought always to remain foreign to the calm course of scientific inquiries.

Before we proceed from the history of the discovery of the Cinchona to its geographical diffusion, and their remaining physical relations, we must cast a glance upon the specific differences of the several kinds of Cinchona. A properly complete botanical disquisition is foreign to the purpose of this Treatise. M. Bonpland and myself will attempt it on another occasion,

viz. in the description of the two thousand new species of plants discovered during our expedition, and partly determined already by our excellent friend M. Willdenow. As almost every species of *Cinchona* is peculiar to its own region, to its own altitude on the mountainous declivity of the chain of the Andes, it is unavoidably necessary, for the satisfactory treatment of the subject, to adjust at least the synonymy of the most important officinal species. I shall certainly make mention of that only, which I have had the opportunity of observing with my own eyes.

---



ON THE  
CINCHONA FORESTS OF SOUTH  
AMERICA.

---

BY A. VON HUMBOLDT.

---

SECTION II.

THE genus *Cinchona* belongs to those tribes of plants, whose species have been considerably multiplied of late. Linnæus knew but two of them, viz. *C. officinalis* and *C. Caribæa*. Vahl,\* in his treatise on Cinchona Bark, enumerates nine; Lambert,† in his English Monograph, eleven; Persoon, in his little *Enchiridium Botanicum*,‡ one-and-twenty species. If we yet add to these, two *Cosmibuena* of the *Flora Peruviana*, belonging formerly to the genus *Cinchona*, the *Cinchona excelsa* of Roxburgh, found in the East Indies, my *C. Condaminea*, Vavassour's *C. spinosa*, and Willdenow's yet undescribed small-leaved *C. brasiliensis*, for which we are indebted to Count Hoffmannsegg in the expedition instituted by him for objects of natural history, then the number of species of Cinchona appears to have increased to twenty-seven. The authors of the *Flora Peruviana* alone have entertained the notion of describing thirteen new species, while M. Mutis has reduced all the *Cinchonæ*, examined by him in South America, to seven only. Even Professor Zea, in

\* Skriver of Naturhistorie Selskabet, B. i. H. i. p. 16.

† Description of the genus *Cinchona*, 1797.

‡ Synopsis Plantarum, P. i. p. 196.

the *Annales de Ciencias Naturales de Madrid*,\* has ventured to prove that almost all the efficacious species, enumerated by Ruiz and Pavon, can be reduced to four, viz. *C. lancifolia*, *C. oblongifolia*, *C. cordifolia*, and *C. ovalifolia*, described by Mutis, in the year 1793, in the literary news of Santa Fe de Bogota.†

Indeed I hardly know any one tree varying more in the shape of its leaves than the Cinchona. Whoever determines single specimens of dried collections, and has no opportunity to examine or observe them in their native forests, will, as is the case with the *Broussonettia papyrifera*, be led to discover different species by leaves which are of one and the same branch. The yellow bark, *C. pubescens*, Vahl, we have found at one and the same time with *fol. ovato-oblongis, ovato-lanceolatis, and ovato-cordatis*. Mutis calls it *C. cordifolia*, because it is the only kind on which sometimes cordate leaves are found. The same species varies like the white Cinchona, *C. ovalifolia*, Mut. (*C. macrocarpa*, Vahl) *foliis utrinque levibus* and *foliis utrinque pubescentibus*. These varieties are represented in those well executed coloured drawings which M. Mutis presented me during my residence in Santa Fe, and which have been deposited, together with a complete *hortus siccus* of my expedition to the tropics, in the *Jardin des Plantes* at Paris. Even the laurel-leaved *C. Condaminea*, the finest bark from Uritusinga, has very diversified leaves, according to the altitude at which it grows, and which equals that of Saint Gothard's or Mount Ætna. It would deceive the bark-peelers (*cascarilleros*) themselves, if they did not know the tree by the glands, left so long unobserved by botanists. In Gonzanamá, not far from Loxa, we made a great number of im-

\* Anno 1801, No. 5.

† Papel Periodico de Santa Fe, 1793, No. 111.

pressions, by means of printer's ink, from these heterogeneous forms of leaves, in order to prove how unsafe all those distinctions are, which have been derived from the leaves only. The long known but yet very imperfect method of ectypa is particularly advantageous for this and similar purposes, as it offers to much-occupied travellers the means of procuring in a few minutes the most correct outlines.

The more the *Cinchona* trees vary in the shape and smoothness of the leaves, according to the altitude in which they grow ; to the severity or mildness of the climate ; to the trees standing singly, or being closely surrounded by other plants ; to the luxuriance of growth, and greater or less humidity of the soil ; the more necessary is it, with regard to the *diagnostic* indications, to pay attention to the form of the flowers, particularly to the length of the anthers, to the proportion between the stamens and anthers, as also between the free and the adherent part of the filaments. It is not sufficient to examine the species in such as have a smooth or hirsute corolla, or the stamens exerted, or inclosed in the tube of the corolla. An attentive observer finds in almost every species a striking difference in the structure of the corolla. Thus, the *C. parviflora*, Mut. has pubescent filaments, and dilated at the base. *C. macrocarpa*, Vahl, anthers nearly sessile, placed in the upper part of the tube of the corolla. *C. oblongifolia*, Mut. filaments very short, anthers situated below the middle of the tube of the corolla. The *Cinchona ovalifolia*, Mut., or the white *Cinchona*, varies frequently with from six to seven, the *C. Condaminea* with from three to four stamens only. In the first, the limb of the corolla is frequently found divided into six or seven, in that of the latter, mostly into four segments. In the *Cascarilla fina de la Provincia de Jaen*, which M. Bonpland intends shortly to describe, I found the anthers always shorter than

the free part of the filaments, and this free part again longer than the adherent one. On the other hand, I observed that in the *Cascarilla fina de Uritusinga*, or the *C. Condaminea*, the anthers are twice the length of the free portion of the filaments, and the free parts are two-thirds shorter than the adherent one. There is scarcely any mention of these proportions in the otherwise excellent descriptions of Cinchonæ for which we are indebted to Vahl, Swartz, and the authors of the *Flora Peruviana*. In the mercantile world, several barks are called Peruvian bark which do not belong to the genus *Cinchona*. Thus, the excellent remedy which the Catalan Capuchin friars of the missions on the River Carony first made known, was called in Spain *Quina de la Guayana*, or *de la Angostura*. M. Mutis became acquainted with this bark in 1759 in Madrid, at the house of Don Vincente Rodriguez de Rivas:\* he employed it in his medical practice, and even then supposed that it did not belong to the genus *Cinchona*. Læfing died in the missions of Carony without knowing this valuable substance. It was afterwards ascribed, sometimes to the *Brucea ferruginea*, which however grows in Abyssinia; sometimes to the *Magnolia glauca*; sometimes (which certainly was more probable) to the *Magnolia Plumieri*. In our expedition we had an opportunity of examining botanically the Cuspare tree, which yields the *cortex Angosturæ*. We discovered it to be a new genus, on which our excellent friend Willdenow, in the Transactions of the Royal Academy of Berlin, has conferred the name of *Bonplandia*.† This name of my travelling companion has been retained for the Cuspare plant, since we have changed the Mexican *Bonplandia geminiflora*, described by Cavanilles, to *Caldasia heterophylla*.

The bark of Cumana, which for the last four or five years has

\* Púpel periódico de Santa Fe, No. 95. p. 337.

† Samml. Deutscher Abhandl. für 1801 und 1802, S. 36.

been sent to Spain, through the exertions of Governor Don Vincente Emparan, under the name of *Cascarilla de Nueva Andalucia*, is likewise different from Cinchona. A chemist would hardly be able to distinguish this Cuspa bark from true Cinchona bark. It is an excellent remedy in the ague. Although we observed for almost a twelvemonth the Cuspa trees of Rio Manzanario near Cumana, yet it never fell to our lot to meet with its flowers. We do not know, therefore, by what distinctive mark it differs from the genus *Bonplandia* and *Cinchona*. The want of stipulæ, however, the situation of the leaves, and the whole habitus, make it more than probable that the *Cuspa* is not a *Cinchona*. The absence of stipulæ is particularly striking. Yet notwithstanding its alternate leaves, the Bark-tree of Cumana might still be a *Cinchona*, for the same reason that *Cornus alternifolia* stands isolated amongst twelve species of *Cornus* with opposite leaves. It has likewise remained doubtful to us, whether the bark of Acatamez, a village situated westward of Ville de Ibarra on the coast of the South Sea, betwixt Rio Verde and Rio Esmeraldita, be the produce of a species of *Cinchona*. The flower of this Acatamez bark-tree, with which we became acquainted during our stay in the town of Popayan, has not been hitherto examined by botanists. Mr. Brown, who long before us was in the South Sea, (in 1793,) has already given some account in Lambert's Monograph of *Cinchona*\* of this new species of the torrid zone. Either from want of geographical information, or by corruption of the name, he calls it *Bark of Tecamez*, instead of *Cascarilla of Acatamez*.

A fourth tribe of plants producing Peruvian bark, although of less medicinal power, is the genus *Cosmibuena* of the *Flora Peruviana*. To this belongs *Cinchona longiflora*, Mut. or *C. gran-*

\* Lambert, p. 30.

*diflora*, Ruiz. It is a tree of great beauty, which we have frequently seen in deep hot valleys exhibiting its beautiful fragrant blossoms. The stamens lie deep and hidden in the tube of the corolla; and the fructification is so similar to that of the other species of *Cinchona*, that the *Cosmibuena* can hardly be admitted to constitute a distinct genus.

On the other hand, it might be advisable to form the *Cinchonæ* with long stamina far projecting from the tube of the corolla, such as Jacquin's *C. Caribæa*, Swartz's *C. angustifolia*, *C. brachycarpa*, and *C. floribunda*, into a separate genus nearly allied to *Cinchona*. The seven species belonging to it possess this peculiarity, that all of them, except one, inhabit islands, viz. the Philippine, the West Indian, and the South Sea Islands, and that they prefer hot valleys, or even plains, to a high mountainous situation. I know but two species upon the South American continent which have *stamina exserta*, Lambert's *C. longiflora* from French Guiana, and the yet undescribed *Cinchona dissimiliflora*, Mut. (*staminibus longe exsertis, corollæ laciniis tubo longioribus, foliis cordato-oblongis*) which, in the kingdom of New Granada, descends from the declivity of the mountains towards the plains as low as 200 toises above the level of the sea. *C. Caribæa* and *C. angustifolia* are found in the West Indies in still lower spots, even in regions which are sufficiently warm for plantations of sugar canes. All these Island *Cinchonæ* with projecting stamens have a smooth corolla. All of them have a capitate or obtuse stigma, the *C. Philippina*\* alone excepted, which M. Née discovered at Santa Cruz de la Laguna, near Manilla. A divided stigma is, on the contrary, observed in all *Cinchonæ* with inclosed stamens. The corolla of the latter is sometimes smooth, sometimes hairy. M.

\* Cavanilles Icones, t. iv. p. 15. 1. 329.

Mutis has already proposed, in the literary News of Santa Fe, to separate the Cinchona with long projecting stamina from the rest. "I know not," says he, "what my friend Linnæus thought of the Cinchona of the South Sea, for its reception in the Supplement only proves the favour of the son, whose opinion has not with me the weight of the opinions of the father." The authors of the *Flora Peruviana* wish to make the Island-Cinchonæ, *Portlandia*;\* but M. Swarz, in Schrader's *Journal für die Botanik*,† proves, that in the Island-Cinchonæ, as in those of the continent, the capsule is a dissepimentum loculorum exacte parallelum, and in *Portlandia* a dissepimentum vere contrarium. Ruiz's *Portlandia corymbosa* is therefore no *Portlandia*, but belongs to the *Cinchonæ filamentis e basi tubi ortis*, to *C. Caribæa*, *C. floribunda*, and *C. brachycarpa*, a groupe of plants which M. Swarz also wishes to unite into a separate genus on account of the flower, but not on the score of fructification. The *C. excelsa*, with enormous leaves, frequently of twelve inches length and fifteen inches breadth, discovered in the East Indies, stands almost in the middle, betwixt the West-Indian and South-American Cinchona, and its existence seems to dissuade us, as it were, from the proposed separation of the two tribes. However, the *C. excelsa* Roxb. approaches less to the Island-Cinchona than to the New Granada and Peruvian ones, corolla pubescenti, staminibus medio tubi insertis, nec e basi tubi nascentibus, antheris nec filamentis exsertis, margine seminum lacero, laud integro. The antheræ in this East India species are eight times longer than the filaments. It is difficult to find reasons for uniting the Island-Cinchonæ into a separate genus, in the formation of the fruit. They differ‡ from the Cinchonæ of the continent of South

\* Flor. Peruv. t. ii. præf. and p. 49.

† Band. I. p. 358.

‡ Schrader, a. a. O. S. 359.



America, “ valvulis minus extrorsum divergentibus et receptaculo ovato nec lineari seminumque margine integro nec lacero.” But except the smooth unindented coat of the seed wings, which I mostly find, the remaining forms of the fruits exhibit gradations, which link together, as it were, all the Cinchonæ. For the new genus of Island-Cinchonæ, delighting in hot plains, there would consequently remain: corolla glabra, filamentis longe exsertis ex basi tubi nascentibus. Semina margine integro cincta. Stigma simplex capitatum. But 1°. Many Cinchonæ staminibus inclusis, and *C. grandiflora* Ruiz, have corollam glabram. 2°. *C. Phillippina* has far projecting filaments, stigma bilamellatum, and yet, as it appears, semina margine integro cincta. 3°. *C. excelsa* has stigma subcapitatum leviter emarginatum, the seed not indented, and the filaments not projecting. Under these exceptions, it would certainly be bold to separate tribes of plants so nearly allied.

The singular prickly *C. spinosa* of St. Domingo appears at first sight to belong least to the genus Cinchona. It is wonderfully small-leaved, and has frequently folia terna verticillata. Another prickly Cinchona differs still more in colour from the genuine Cinchona bark trees; it grows near Guayaquil, on the coast of the Pacific, and M. Tafalla showed it to us in the winter of 1803, during our stay there. This undescribed species is a creeper, and on that account in some measure related to the genus *Danais* from Madagascar, which Persoon ranks next in succession to the *Portlandia*, since the *Padeira fragrans*, more resembling the Cinchona, has been separated from *Padeira fatida*. This new *C. scandens* of Tafalla has in other respects the complete fructification of the ague-curing Cinchona, and belongs indisputably to the most remarkable phenomena of the physiognomy of plants.

The very same fruit of the genuine Cinchona is also produced

by *Pinkneya pubens* Michaux,\* a tree which I found cultivated together with *C. Caribaea* in the excellent botanic garden of Mr. Hamilton near Philadelphia. The *Pinkneya* grows on Mary's River, in the province of Georgia, and is already described by Bartram, propter calycis laciniam unicam foliaceam bracteæformem, by the name of *Mussuenda bracteolata*. The medicinal powers for the cure of ague possessed by this plant, nearly allied to the genus *Cinchona*, and growing without the tropics, have not yet been investigated. On the other hand Mr. Walker has shown in two excellent treatises, that the bark of *Cornus florida* from Virginia, and of *C. sericea* from Pennsylvania and South Carolina, and even the Tulip tree (*Liriodendron Tulipifera*) may be used with advantage in North America as remedies against agues.† In the kingdom of New Spain, where hitherto no species of *Cinchona* has been discovered, as the curator of the Academical Botanic Garden at Mexico has assured me, the yet undescribed *Portlandia mexicana*, discovered by M. Sesse, may supply the place of the *Cinchona* bark of Loxa. In the East Indies (according to D. Klein in Tranquebar) the *Swietenia febrifuga*, figured by Roxburgh, a plant of Swartz's and Jacquin's, *Portlandia hexandra* (Aublet's *Contaria Speciosa*), nearly allied to *Cinchona*, produces the bark of French Guyana, known in France by the name of *Ecorce fébrifuge de Cayenne*,‡ and which is no more derived from a *Cinchona*, than is the bark of Cumana or the Cuspare of Angostura.

Thus much respecting the generic characters of the plants which approximate to *Cinchona*, and all of which belong to the

\* Flor. Americana, I. p. 105.

† Walker on the virtues of the *Cornus* and the *Cinchona* compared. Philad. 1803. Rogers's Diss. on the properties of the *Liriodendron*. Phil. 1802.

‡ Ventenat Tableau du Regne Vegetal, t. ii. p. 578.

great family of *Rubiaceæ*. We see that as Caoutchouc\* is obtained in abundance from the juices of the most diversified plants on the Orinoco and in Cayenne; from the *Hevea* on the Canno Pimichin, a branch of the Negro; from the tree *Jacio* in the kingdom of New Granada; from a new species of *Ficus* in the province of Popayan, near the Indian village La Cruz; from a *Lobelia* (to be described by us) in Bengal; from the *Urecola elastica*, figured in the 5th volume of Asiatic Researches; in Madagascar, from the *Commiphora madagascarensis*; so does nature also offer to us the ague-curing principle, or that mixture containing tannin and absorbing oxygene, which we obtain of a preferable quality from *Cinchona Condaminea*, *C. pubescens*, Vahl. and *C. lancifolia*, Mut. in plants which do not even belong to one and the same genus. A chemist would perhaps find greater differences between the West-Indian and South-American *Cinchona* barks, than between the Cuspa of Cumana and the *Cinchona* bark of Loxa; and yet the Cuspa tree, *foliis alternis, stipulis nullis*, is most probably a very remote genus from *Cinchona*.

After we have separated with care, partly what in a botanical point of view is nearly related to *Cinchona*, partly what passes in commerce amongst different nations by the name of China, Cascarilla, Quinquina, or Ecorce fébrifuge; after we have separated the *Cinchonæ* with inclosed filaments, not growing from the lower end of the flower tube with divided stigma and indented margins of the seeds, from the Island-*Cinchona*, whose long projecting filaments grow from the bottom of the flower-tube, and which have, together with unindented seed wings, an

\* The *Cecropia peltata* is frequently mentioned as a tree yielding a part of the American caoutchouc. But I doubt whether any part of the new continent makes use of a juice so difficult to inspissate.

undivided stigma; after we have examined the relation and supposed similarity of mixture of Cinchona, Portlandia, Coutarea, Cosmibuena, Pinkneya, Danais, Bonplandia, Cuspa, and the Acatamez tree, we pass to the definition of those species of Cinchona which have become an object of great importance in the practice of physic and in the intercourse of nations. Without the fundamental exposition of the specific characters, and without adjusting some part of the synonymy, every thing which I am going to state respecting the geographical diffusion of the Cinchonæ, and their physical relations, would remain indistinct and dubious, since (as I have mentioned above) a peculiar region has been destined for almost every species, and some botanists have, to the great detriment of science, given one and the same name to the most heterogeneous species. Thus, for instance, *Cinchona longiflora*, Mut. is totally different from *C. longiflora*, Lambert. It is true, they both have a smooth corolla, and belong to the Cinchonæ which are fond of heat and possess fewer medicinal powers. But the first, from New Granada, has inclosed stamens, and is probably identical with *C. grandiflora* Flor. Peruv. On the other hand, the *C. longiflora*, Lambert, from French Guiana, belongs to those species which have long projecting filaments and very short capsules. *Cinchona Caribæa*, Jacq. is totally different from that *Cinchona Caribæa* described in the *Journal de Physique*, Oct. 1790. The diagnoses which I add are not borrowed from works already published, but arise partly from my own observations made from nature itself, partly from an instructive intercourse with M. Mutis.

---

### *Characteristics of some Species of Cinchona.*

---

VAHL, in his excellent Monograph, augmented by Lambert, divides all the species into two groupes of plants, floribus tomentosis, staminibus inclusis, and floribus glabris, staminibus exsertis. This division possesses this fault, that two characters are placed opposite each other, which are by no means observed at one and the same time in all the species at present known. Certainly no Cinchona with tomentose flowers has long projecting stamens, for in the East Indian species the anthers are merely visible; but there are Cinchonæ which have, like *C. parviflora*, Mut. and *C. grandiflora*, Flor. Peruv. a smooth corolla and inclosed stamens. With more, although not with perfect justice, we might separate Cinchonæ staminibus inclusis, stigmatibus bilamelato, seminum ala denticulatâ vel lacerâ, and Cinchonæ filamentis insertis ex imo tubi nascentibus, seminibus membranâ integrà cinctis. However, it seems more correctly logical to divide the Cinchonæ into those with smooth and into those with hairy corollas. The first division merely subdivides itself, according to the length of the stamens, into two smaller tribes, and (what is certainly an important object) all the useful and agree-curing species associate into one groupe.

#### A. CINCHONÆ COROLLIS TOMENTOSIS.

1. *C. Condaminea*, corollæ tubo hirto, foliis ovato-lanceolatis utrinque glaberrimis, in axillis nervorum inferne scrobiculatis. Humb. et Bonpl. Plant. Equin. fasc. ii. p. 29. tab. 10.

This species, the fine bark of Uritusinga, could only be taken

for the *C. glandulifera*, *Flor. Peruv.*; but this latter differs eorollâ solummodo intus lanuginosâ, tubo externe glaberrimâ, foliis inferne villosis.\* The inhabitants also enumerate the *C. glandulifera*, which is called (at Chicoplaya) Cascarilla negra, among the less efficacious species of Cinchona.

If any one species deserved exclusively the name *C. officinalis*, it would be the tree which produces the Cascarilla fina de Uritusinga, a bark which has always been held in Spain as the most efficacious in tertian agues, and which at present is gathered only for the Royal Apothecaries' Hall, and is therefore never met with in trade by lawful channels. Notwithstanding these preferences, we have, for several reasons, preferred giving it a new name, not derived from its quality or medicinal powers. 1°. Not one species, but all provided with hairy and woolly blossoms, are Cinchonæ of the shops, and no species deserves an absolute preference, since different species are to be applied according to the difference and form of the disease: for instance, in intermittent fevers of long standing, the *C. Condaminea* and *C. lancifolia*, Mut.; in diseases of the muscles or suppurating ulcers, the *C. oblongifolia*, Mut.; in the after treatment, to prevent relapses, the more mild *C. cordifolia*, Mut. 2°. In botanical writings, species of Cinchona totally distinct have been described by the name of *C. officinalis*. Had we bestowed the same name on the Cinchona of Uritusinga, it would have been confounded with the yellow *C. cordifolia*, Mut., the white *C. macrocarpa*, Vahl, or even with the *C. nitida*, Ruiz, which at different periods have been called *C. officinalis*.

This latter point, equally important to the botanical synonymy and to the materia medica, merits a more circumstantial explanation. It is asked, What plant did Linnæus, in the 12th edition

\* *Flor. Peruv.* t. iii. p. 1. t. 224.

of the *Systema Naturæ*, call *C. officinalis*? Vahl maintains that it was his *C. macrocarpa*\* from the kingdom of New Granada, which he received from Ortega. But since *C. macrocarpa*, Vahl is nothing else but our white large-flowered Cinchona of Santa Fe, *C. ovalifolia*, Mut.; and as, according to M. Mutis's own testimony, it had never been seen by Linnæus, then the *C. macrocarpa*, Vahl cannot be quoted as synonymous with *C. officinalis*, Linn. *Syst. Nat. ed.* 12. The great botanist of Copenhagen, whose early death is so justly deplored by all the friends of science, was misled to an erroneous synonymy in the following manner: 1°. He knew that Linnæus had at a later period founded his description of *C. officinalis* on specimens which he received from Santa Fe; and 2°. he erroneously presupposed that all the Cinchona forests in the neighbourhood of Santa Fe, discovered by M. Mutis, consisted of white Cinchona, or *C. macrocarpa*.

Linnæus united, as already observed, two quite different plants under the denomination of *C. officinalis*. The dried specimen of which he made use for establishing the diagnosis, was (as M. Mutis has repeatedly and orally assured me) yellow Cinchona, *C. cordifolia*, Mut., and the same species which Vahl calls *C. pubescens*, but of which one variety has entirely smooth leaves, *folia utrinque glabra*. Linnæus quotes as synonymous the species described by Condamine in the *Mem. de l'Academie*, 1738: he consequently united one species from Santa Fe with another which grows exclusively in the neighbourhood of Loxa.

Ruiz, in his *Quinologia*,† calls a species *C. officinalis*, which he afterwards describes in the *Flor. Peruv.* by the name of *C. nitida*. He maintained at the time, that this tree, which

\* Act. Havn. I. p. 19. Lambert, p. 22.

† Cascarilla officinal. Quinolog. Aret. II. p. 56.



grows in the forests of Huamalies and Xauxa, consequently far from Loxa, between the 10th and 12th degree South lat., was the Cinchona described by La Condamine. In the *Supplemento a la Quinologia*, p. 68, a botanical disputation which appeared against M. Zea, Mutis, and Cavanilles, this assertion is very justly withdrawn. Indeed the *C. nitida* or *C. officinalis* Ruiz is no other than the Cascarilla naranjanda from Santa Fe, or *C. lancifolia* Mut.

Since therefore four different species, the *Cascarilla fina de Uritusinga*, which Condamine has figured, *C. pubescens* Vahl, *C. nitida* Ruiz, and *C. macrocarpa* Vahl, have already received the name of *C. officinalis*, we have called the Cinchona of Uritusinga, in commemoration of its first discoverer, *C. Condaminea*. It is true that M. Ruiz, in his *Supplemento a la Quinologia*, gives it as his opinion, that the plant called at present Cascarilla fina at Loxa, was not the plant described by the French astronomer; but not only the unanimous testimony of all inhabitants of Loxa, Caxanuma, and Uritusinga, speaks against this, but also Jussieu's *Hortus Siccus* at Paris. M. Bonpland has carefully compared our *C. Condaminea* with the specimens which were collected by Joseph de Jussieu and La Condamine. No doubt remained concerning the identity of the species.

The *C. Condaminea*, like *Myristica*, *Caryocar amygdaliferum*, and many precious products of the tropics, is confined to a very small space, and it has been hitherto most imperfectly described. No botanists, neither Ruiz and Pavon, nor Tafalla, nor Nee, nor Hânke, nor Mutis, have observed it before us at its place of growth. The following may be considered as imperfect figures of the *C. Condaminea*: Mem. de l'Acad. de 1738, p. 114.; Lamarek Encyclopédie, pl. 164. fig. 1.; Vahl Skrivt. af Naturh. Selfkabet I. tab. 1., and Lambert. Monogr.

tab. 1. The true character of the leaves has been missed every where; and it would be bold to quote these synonyms, if it were not possible to verify them by examining the specimens which have served for the drawings.

Our *C. Condaminea* grows under the 4th degree south latitude, on the mountainous declivity in the mean altitude between 900 and 1200 toises. It requires a milder climate than the orange-coloured Cinchona, *C. lancifolia* Mut., from Santa Fe. It is exposed to a mean temperature from 15 to 16 degrees Reaumur, which is about the mean warmth of the Canary Islands.

I here insert an exact diagnosis of the *C. Condaminea*, which I drew up at Gonzanama, and of which (as it remained buried beneath astronomical manuscripts) M. Bonpland could not avail himself in the publication of the second fasciculus of *Plantæ Æquinoctiales*.

*Calyx* tubulosus basi angustatus sub-5-gonus subhirsutus ore 5-dentato, dentibus ovatis acuminatis patentibus. *Cor.* hypocrateri-formis tubo cylindrico rubro lævissime hirtio 5-gono (ad basin persæpe fisso) limbo 5-fido sæpissime 4-fido, laciniis ovatis acutis apice et margine ciliatis, vel tomentosis ciliis albis. *Faux* corollæ et totius tubi pars interior rubra glabra, nec ciliata, *Stamina* quinque, rarius tria et quatuor. In corollâ 4-fidâ sæpius stamina quinque numeravi. *Filamenta* ex rubro albescentia imo tubi adnata, cum eo coherentia, tertiam tubi partem æquantia, eademque tantum tertiâ suæ longitudinis parte liberâ. *Antheræ* planæ lineares, parte liberâ filamenti duplo longiores. *Germen* rotundum subdepressum rubescens, sæpe punctatum et 5-sulcatum. *Stylus* fere longitudine tubi, crassus, teres. *Stigma* tubum vix superans, viridescens, compressum, bifidum sæpe bipartitum. *Capsula* calyce coronata, oblonga, flore tertiâ parte longior, bi-

partibilis, striato-costata, de medio hiscens, dissepimento parallelo. *Semina* plura compressa alâ membranaceâ crenulatâ cincta. *Rami* cicatrisati post casum foliorum, sub-4-goni; juniores glaberrimi, subpulverulenti. *Folia* petiolata decussatim opposita lanceolata acuta, integerrima, utrinque viridia, nullis venis rubris picta, fere laurina, glaberrima, in axillis nervorum internè scrobiculata. *Glandulæ* nullis pilis obsitæ, convexitate in paginâ superiori folii conspicua, venas altitudine superantes. Pagina folii inferior scrobiculum demonstrat. *Petioles* sæpè rubescentes, supernè plani, internè teretes. *Stipulæ* deciduæ, oblongæ, carinatæ. *Panicula* axillaris et terminalis, folio longior floribus brevè pedicellatis.

Size of the parts in a tree flowering for the first time:— Calyx,  $1\frac{7}{10}$  lines long; corolla,  $5\frac{1}{10}$  lines; capsule, 8 lines long,  $3\frac{1}{2}$  lines broad; according to Parisian measure. Full-grown leaves exclusive of the petioles, 4 inches 3 lines long, and 1 inch 9 lines broad. The young leaves frequently have a length of 5 inches, and the great breadth of 4 inches 7 lines.

The *C. Condaminea* varies amazingly in the leaves before the tree comes into flower. In the shoots and very young trees we frequently find folia latè ovata or ovato-lanceolata. The older the tree is, the narrower are its leaves. In great luxuriance of growth, the little grooves frequently vanish, which appear on the upper side of the leaf as convex glands. On very broad leaves, in which the parenchyma is considerably extended, they are almost entirely wanting. However, even then, we always meet with single folia scrobiculata upon the same branch.

2. *C. lancifolia foliis lanceolatis acutis utrinque glaberrimis*. Mutis, Period. de S. Fe, p. 465. (et Flor. Bogot. Mss.) In Santa Fe it is known by the names of Quina naranjanda, Quin-

quina orangé, or orange-coloured Bark. Next to *C. Condaminea*, it is the most efficacious febrifuge of all the kinds of Cinchona; the species which M. Mutis, in his *Quinologia*, calls the Quina primitiva directamente febrifuga, because he prefers it to the three following species, and because he thinks (what is erroneous, however) the fine Cinchona of Uritusinga is the same species as Quina naranjanda of New Granada. The *C. lancifolia* has smaller leaves than the others with tomentose corollas. They are also continually smooth, when on the contrary the place of growth produces, in the yellow and white Cinchonæ, varieties with hairy leaves.

The Quina naranjanda loves a rough climate. It grows between the 4th and 5th degree north lat. on mountainous declivities from 700 to 1500 toises high. The mean temperature of this place of growth is about equal with that of Rome. It amounts to 13° Reaumur; however the Cinchona trees ascending highest towards the summit of the mountains are mostly exposed to a temperature of from 8° to 9°. During the cold at nights, the thermometer falls in these alpine forests for hours as low as the freezing point; however, as far as 1500 toises high no snow falls in this latitude.

The Quina naranjanda, together with the *C. Condaminea*, belongs to the more scarce species. Nature herself has produced them in the kingdom of New Granada in a much smaller number than those of the yellow and red Cinchonæ, which latter ones form here and there almost closely-connected shrubberies. *C. lancifolia*, on the contrary, stands always single; and what is to be regretted in so valuable a produce is, that it does not increase so easily by shoots from the root, as the *C. cordifolia* and *C. oblongifolia*. In the Monographs of Vahl and Lambert, no mention is made of the species called Naranjanda of Santa Fe. An

indisputable synonym on the contrary is *Cinchona angustifolia* Ruiz, *Suppl. à la Quinologia*, p. 21, where an excellent figure is given. It is indeed surprising, that so exact a botanist as M. Ruiz should change the old Mutisian name *C. lancifolia* for *C. angustifolia*, since that name has previously been given by Swartz\* to an Island-Cinchona with a smooth corolla and long projecting stamens.

Professor Zea thinks, and, as it appears to me, with perfect propriety, that several species of the *Flora Peruviana* denote merely different states of the Quina naranjanda, such as depend on the age, the climate, and the place of growth. The following appear to be varieties of the *C. lancifolia* Mut. : 1°. *C. nitida* Flor. Peruv. II. Icon. t. 191. (Ruiz, *Quinol. II.* p. 56.) Ruiz's Cascarilla officinal. 2°. *C. lanceolata* Flor. Per. II. p. 51. and *C. glabra* Ruiz *Quin. II.* p. 64. Cascarilla lampina, of which no figure is given. M. Zea thinks he may venture to add to these, the *C. rosea* Flor. Peruv. II. Ic. 199. a species which is said to be the most scarce in Peru, and (what agrees little with the nature of *C. lancifolia*) to descend from the mountains into the lowest regions.†

The Cinchona Bark so famous in Cadiz by the name of Calisaya, and of such particular medicinal power, belongs, according to Mutis, indisputably to *C. lancifolia*. Ruiz considers it, in his *Quinologia*, as synonymous with his *C. glabra*. But in his disputation against Zea, he withdraws this opinion, and assures us that there is no species growing in the neighbourhood of Huanuco which produces a bark similar to the Calisaya.‡ The name Calisaya is that of the province producing this bark,

\* Flor. Ind. occ. I. p. 350. Lambert, p. 29. Pl. 9.

† Ruiz *Supplem. à la Quinol.* p. 54.

‡ P. 73 and 95.

which is situated in the most southerly of Peru, in the Intendencia de la Paz.

The second edition of a modern French work, Alibert's *Traité de Fièvres intermittentes*, contains very exact figures of the orange-coloured Cinchona, as well as of the three following Mutisian species. They have been made from dried specimens, determined by M. Mutis, and supplied by M. Zea from his collection during his residence at Paris.\*

3. *C. cordifolia* fol. orbiculato-ovatis sæpe subcordatis subtus tomentosis supra pubescentibus, Mut. Mss. Quina amarilla, Quinquina jaune, yellow Bark from Santa Fe, the species, as observed above, described by Linnæus in *Syst. Nat. t. ii. ed. 12. p. 64.* under the name of *C. officinalis*. The anthers in *C. cordifolia* and *C. lancifolia* reach as far as the upper parts of the flower-tube; when on the contrary, in the red Cinchona (*C. oblongifolia*) they are deeply hidden in the middle of the tube. *C. cordifolia* has two varieties. Var.  $\beta$  foliis vix cordatis utrinque glabris.  $\gamma$  foliis utrinque hirsutis. By the common people, in the kingdom of New Granada, it is called Velvet Bark. It grows under the 4th degree North latitude, in heights betwixt 900 and 1440 toises. Cordate leaves occur but seldom: however, almost every branch exhibits some of them. *C. cordifolia* Mut. is, according to Bonpland's examination, identical with *C. pubescens* Vahl, as proved by Jussieu's collection, from which Vahl received his specimen. Joseph Jussieu had collected, in 1738, this species of Cinchona and *C. Condaminea* in the forests of Loxa.

The *C. ovata* Flor. Peruv. II. t. 195. *Cascarilla pallida* Ruiz, *Quinol. Art. 7. p. 74.* called in the neighbourhood of

\* Some of these figures are evidently copied from those in *Flora Peruciana*.—EDIT.

Pozuzo *Pata de Guallerata*, is likewise a synonym of *C. cordifolia* Mut. Ruiz and Pavon themselves have latterly acknowledged this identity.\*

The *C. hirsuta* Flor. Peruv. II. Ic. 192. Cascarillo delgado, or *C. tenuis* Ruiz, Quinol. II. p. 56. is, according to Zea, a variety of *C. cordifolia* Mut. Does *C. purpurea* Flor. Per. II. t. 193. or Cascarilla morado Ruiz, Quinol. Art. v. p. 67. also belong here? This species varies surprisingly in its leaves, and on one and the same tree too.

4. *C. oblongifolia foliis oblongis acuminatis glabris, filamentis brevissimis, antheris infra medium tubi latentibus.* Mut. Mss.

Quina roxa, Quinquina rouge de Santa Fe, differt a *C. lancifolia*, 1°. foliis latoribus, majoribus oblongis nec lanceolatis; 2°. antheris haud in summo tubi latentibus.

It grows under the 5th degree North lat. in heights from 600 to 1900 toises, and is particularly common in the neighbourhood of Mariquita, a small town, which was for a long time the seat of M. Mutis's botanical expedition. It frequently bears much larger fruit than the white Cinchona, *C. ovalifolia*, for which reason it would deserve the name of *macrocarpa* with more propriety than the latter one. Its bark is less efficacious than that of *C. Condaminea* and *C. lancifolia*, yet more so than the yellow Cinchona, (*C. cordifolia*.) It is more stimulating, for weak constitutions, in inflammatory diseases frequently dangerous, but the more beneficial when applied externally in diseases of the muscles, suppurating and sphacelous ulcers.

The yellow Cinchona, *Cascarilla amarilla* Quinol. Art. vi. p. 71. or *C. magnifolia* Flor. Per. II. Ic. 196. which, on ac-

\* Supplem. à la Quinol. p. 18.



count of the fragrant and orange-flower smell of its blossoms, is called in Peru, Flor. de Azahar, and in Popayan, Palo de requeson,\* is, according to the latter confessions of Ruiz, identical with *C. oblongifolia* Mut. or with the red Cinchona of Santa Fe.

5. *C. ovalifolia fol. ellipticis supra glaberrimis subtus pubescentibus antheris in parte tubi superiori latentibus filamentis vix ullis.* Mut. Mss.

Quina blanca, Quinquina blanc: White Cinchona of Santa Fe.

Var.  $\beta$ . fol. utrinque pubescentibus.

$\gamma$ . fol. utrinque lævibus.

Both varieties, particularly the first, have frequently a corolla with 6 or 7 divisions, and 6 or 7 stamens.

It grows under the 3d to the 6th degree North lat. in heights from betwixt 700 and 1400 toises. The variety with smooth leaves is frequent near San Martha. The *Cinchona macrocarpa* Vahl. (Lambert, p. 22. t. 3.) is a true synonym of this, acknowledged by Mutis and Ruiz themselves.† Amongst the Cinchonæ with hairy corollas it is the largest-flowering one of all. It must not, however, be confounded with *C. grandiflora* Flor. Peruv. II. p. 54. (*Cosmibuena obtusifolia* Flor. Peruv. III. t. 198.) having a quite smooth corolla.

6. *C. brasiliensis foliis oblongis acuminatis, venis subtus pubescentibus paniculâ terminali, tubo calycis longitudine.* Willd. Mss.

A very small-flowering species, for which we are indebted, as observed already, to Count Hoffmannsegg, together with Aublet's

\* Period, de Santa Fe, p. 335.

† Suppl. p. 18.

and Lambert's *C. longiflora* from French Guiana, the only Cinchona which grows on the easterly coast of the South American continent. Nothing decisive is known about the height of its place of growth; but as it has been sent from the neighbourhood of the town of Gran Para, at the mouth of the Amazon river, and as in this region there are only low hills found, we are allowed to suppose that *C. Brasiliensis* belongs to the hot regions.

The character of this species by M. Willdenow, tube of the corolla the length of the calyx, distinguishes this Cinchona from every one hitherto described. Throat of the corollæ hairy; hairs few, short, appressed, situated on the interior surface of the corolline laciniae.

7. *C. excelsa* corollâ pubescente, filamentis e medio tubi nascentibus, antheris exsertis, foliis oblongis subtus pubescentibus. Roxb. Plant. of the Coast of Coromandel, ii. t. 106.

The only Cinchona hitherto discovered on the continent of the ancient world, about whose medicinal use and its bitter no trials have however as yet been made. It has very small greenish-white flowers, and of all Cinchonæ the largest leaves, sometimes one foot long and five inches broad.

The *C. excelsa* (*Bundarvo* of the Felinga Indians) grows in the mountain chain of the Circars, which runs along the north-easterly coast of the great peninsula of Hindostan. Retzius\* has at an earlier date, from accounts communicated to him by König, mentioned a Cinchona which grows in Malacca, opposite to the coast of Coromandel, and which produces the genuine *terra japonica*, called *Cotta Cambar*, a vegetable produce, which for a long time was erroneously ascribed to *Mimosa spicata* Pluk. Might not this Cinchona from Malacca be a different species from *C. excelsa*?

\* Observ. Bot. fasc. iv. p. 6.

B. *Cinchonæ corollis glaberrimis.*a. *staminibus inclusis.*

8. *C. grandiflora*, tubo corollæ longissimo, fol. lanceolato-oblongis utrinque glabris.

I have retained the former name of the *Flor. Per.* M. Ruiz calls this species at present *Cosmibuena obtusifolia*. (*Flor. Per.* vol. iii.) It is identical with *C. longiflora* Mut., a name which would cause confusion, since Lambert enumerates as *C. longiflora* the Island-Cinchona staminibus longe exsertis, described as *C. Caribæa* in *Journ. de Phys.* Oct. 1790.

It is fond of warm regions, and descends from the mountains in heights from two and three hundred toises. It grows in regions whose mean temperature is from 18 to 19 degrees.

9. *C. parviflora foliis ovatis glabris, filamentis basi dilatatis et pubescentibus.* Mut. Mss.

It has the smallest fruit of all Cinchonæ.

b. *staminibus exsertis.*

10. *C. dissimiliflora foliis cordato-oblongis glaberrimis, limbo corollæ tubo longiori, capsulis sublinearibus angustissimis.* Mut. Mss.

Next to *C. longiflora* Lamb. the only species of the continent which has stamina exserta. Grows in heights betwixt 200 and 700 toises in warm regions.

11. *C. Caribæa* Swartz.

12. *C. longiflora* Lamb.

13. *C. lineata* Vahl.

14. *C. floribunda* Swartz.

15. *C. angustifolia* Swartz.

16. *C. brachycarpa* Vahl.

These six latter species grow all in the West-India Islands, and love a temperature of from 17 to 22 degrees R.

17. *C. corymbifera* Forster.

Native of the Friendly Islands.

18. *C. Philippica*, discovered near Manilla by Nec.

I do not venture to assert that all *Cinchonæ* hitherto known are comprehended within the eighteen species arranged here. I have merely wished to enumerate those which are known to me, partly in their natural state partly from good figures, and which to me appear indisputably specific from each other. *C. acutifolia*, *C. micrantha*, *C. glandulifera*, *C. dichotoma*, *C. (Cosmi-buena) acuminata*, and *C. spinosa*, deserve a closer investigation. The genus might perhaps increase to twenty-four species.

---

# MEMOIR

## ON THE

### DIFFERENT SPECIES OF QUINQUINA.

BY M. LAUBERT,  
CHIEF PHYSICIAN TO THE SPANISH ARMY.

**B**OTANISTS recognise about twenty Barks of the genus *Cinchona*, but the number of those which are current in commerce is much more considerable.

They are vended singly, or mixed with each other, under the names of *Cascarilla de Loxa*,\* *Calisaya*, *Red Cascarilla*, and *Huanuco*.

#### CASCARILLA DE LOXA.

Under this name are included all the most esteemed and select Quinquinas of the province of Loxa. Five species of it

\* The word *Quinquina* is not used in Peru, and is rarely employed in Spain among traders; they adopt the term *Cascarilla*, and those who gather the barks are called *Cascarilleros*. The *Croton chacarilla* of Linnæus is known in Peru by the name of *Chacarilla*. It appears that the term *Quinquina*, as M. de Condamine has observed, has been taken from the febrifuge employed before the discovery of this bark, particularly by the Jesuits; it was the *Myroxylon peruiferum*, called in Peru *Quinoquinos* and *Quinoquina*. This conjecture is the more probable, because the *Quinquina* at first was known also by the name of Jesuit's Powder, and the genus *Myroxylon peruiferum* has not been well determined and described until the present day.

We may just observe that M. Ruiz thinks the *Myrospermum* and the *Toluifera* ought to be comprehended under the generic term *Myroxylon*.

are known : the *yellow*, the *red*, the *Peruvian*, the *thin*, and the *furred* (*lampina*). The two first have always obtained a preference in His Majesty's pharmacy, and have been reserved for the packets destined for foreign powers. The Peruvian is the next in estimation ; but we must not confound this species of *Loxa* with the Peruvian bark of commerce, which is rarely found unadulterated, and which almost invariably contains Barks of inferior quality. Lastly, the thin and the furred are also in great request, and almost as much esteemed as the Peruvian. M. Ruiz has given a description of the three latter in his *Quinologia*,\* and has defined its botanic characters.

To these five species may be added the *lizard-shaped Cascarilla*, less valued indeed, and unknown to botanists, but regarded by them and in commerce as one of the fine Quinquinas of this province.

The botanists of the expedition to Peru† believe that the finest species of *Loxa* have been longest known and used in medicine ;

\* A description of three of these species is to be found in the *Quinologia* of M. Ruiz.

This work appeared in 1792 ; it treats of the discovery of *Quinquina* ; of its qualities, of the trade in it, and of its value in the different provinces of Peru, which in his time amounted to more than 250,000 livres yearly ; of the places which produce the finer sorts ; of the gathering, desiccation, and transport of the barks ; of the method practised in Peru for preparing the extract of fresh barks, &c. He then gives the generic characters of the *Quinquina*, with a description of seven species, the characteristic qualities of the red *Quinquina*, of the Calisaya, of the *Quinquina* with olive leaves. In the *Supplement*, which appeared in 1801, under the names of Messrs. Ruiz and Pavon, those learned botanists gave a description of four new species discovered by Tafalla ; the qualities of the bark known by the name of *Huanuco*, and of the *C. laccifera* ; the description of the *C. angustifolia*, which appears to be of the same species with the *lancifolia* of Mutis ; an answer to a Memoir of M. Zea, on the *Quinquinas* of Mutis or of Santa Fe ; and lastly, a Letter to M. Jussieu in answer to some observations of that learned botanist on the *genera*, announced in the *Prodromus* of the *Flora Peruviana*.

† The expedition to Peru took place in 1777 ; it lasted eleven years. Messrs. Ruiz and Pavon were appointed to this expedition as botanists. They were powerfully seconded in their researches by M. Dombey, a French physician and naturalist of rare merit. When the mem-

they found their opinion particularly on the preference which they have always held in the royal pharmacy, and on the tradition of the inhabitants of that kingdom, where the febrifuge quality of the Quinquina was first proved.\*

This is not the opinion of M. Zea and the botanists of the expedition to Santa Fe.† They regard the *C. lancifolia* of Mutis as the most ancient, and designate it by the epithet of primitive; according to them, this Quinquina should also seem the most efficacious in intermittent fevers.

### I. CASCARILLA AMARILLA (YELLOW).

THIS Quinquina, known also in Peru by the name of *Cascarilla de Loxa*, is the genuine Cinchona of Ruiz.‡ The tree to which it belongs grows in the provinces of Loxa, Cuença, Jaen de Bracamoros, and others.§

Members of the expedition quitted America, M. Tafalla was intrusted by them with the continuance of their botanical labours and researches. This gentleman, aided by M. Menzanilla, has enriched botany with several interesting discoveries, and has greatly augmented the family of the Quinquinas.

\* It is well known that the generic term was taken by Linnæus from the title of the viceroy of Peru, Don Geronimo Fernandez de Cabrera Count Chinchon. The Viceroy ordered proof to be made of the febrifuge qualities of the Quinquina before he administered it to his lady, and greatly contributed to make its efficacy known.

† Don Joseph Celestino Mutis went to New Granada in 1760; and in 1780 he was appointed director of the botanic expedition of Santa Fe, which commenced its labours in 1784; his associates were Messrs. Valenzuela, Landat, and Camblér. To these botanists we owe a valuable collection of materials. M. Mutis published in the periodical journals of Santa Fe his medical observations on the four Quinquinas, designated by him under the terms orange-coloured, red, yellow, and white, and which he says he discovered. It is known that M. Lopez Ruiz disputes with him the discovery of the two former.

‡ M. Ruiz thinks that Linnæus should have employed the word Chinchona instead of *Cinchona*, which does not denote the real title of the Viceroy of Peru.

§ The *Quinquina de Loxa* used in the royal pharmacy was procured latterly from the mountains of Uritzinga, Guatizinga, and Caxanuma; practitioners having found by experience that



This bark is slender, about the size of a goose-quill, pretty well rolled,\* and covered with a slight thin epidermis of a fallow grey. Its internal surface has the fineness and aspect of Ceylon cinnamon; its fracture is very clear, except on the inner side, which presents little fibrous filaments, extremely fine; its

it is preferable to that gathered at Quite, Jaen de Bracamoros, Cuença, and other places. D. Vicente Olmedo, a distinguished botanist, was appointed by the King to superintend the collection and desiccation of this precious bark.

\* The thickness, fineness, and roundness of the barks must be taken into consideration when a good choice is to be made. It is necessary to ascertain not only whether a bark be of a good quality, but whether it has been well dried and preserved, whether it has belonged to an old branch or to too young a branch, &c. and these three characters may be useful in influencing our choice. The following are some general ideas on the inferences deducible from them.

The barks more than an inch and a half in width must proceed from the trunk or the great branches; time and parasites may have altered these barks, and particular attention must be paid to the state in which they are found. Those which are not so thick as a quill, must have belonged to branches still too young, which may not have acquired a suitable degree of maturity, according to the language of the Cascarilleras.

The same observations are applicable to a bark which is too thin or too thick; but in order to judge well of its thinness or thickness, regard must always be had to the species to which the bark belongs.

As to the rolling or roundness, it is well known that the barks are separated from the branches in longitudinal slips by means of a very fine knife. They roll themselves up, because the internal surface being more fibrous, and charged with more humidity, must shrink more considerably than the external surface. Their being well rolled is a proof that they have belonged to very ripe branches; that is to say, neither too old nor too young, and that they have been carefully dried. A feeble rolling can accord only with old barks, or those which have been too slowly dried. Lastly, when the bark is too much twisted, and forms as it were a spiral of a turn and a half or thereabouts, it may be supposed to have been dried too suddenly, or to have been gathered before the period of maturity.

*The Cascarilleras decide in the following manner on the maturity of the barks. They begin by extracting from each branch a strip of bark; if after its extraction it begins to redden on the inner side, this is an infallible proof, according to them, that it has arrived at maturity; but if after three or four minutes this colour is not manifested, they reject it as not in season. The Cascarilleras affect to distinguish the barks which have not attained the proper degree of ripeness, by the feeble colour of the inner surface, the less aromatic smell, the less agreeable taste, the easier fracture, and the less consistent texture.*

smell, which is considerably aromatic, becomes perceptible on pulverization or decoction; its bitterness is successively developed by a prolonged mastication, but it is always very inferior to that of the Calisaya; it is also styptic, but without acerbity. This Bark is rarely found without mixture: on its external surface are to be observed some slight transversal and almost parallel fissures.\*

## II. RED CASCARILLA.

This is the name which this Bark bears in Peru; it is more common than the former, and is found in greater quantity among the barks used in the royal pharmacy.†

\* It is astonishing that the botanic characters of this species have not yet been published, and that M. Ruiz has not given a description of its bark in his *Quinologia*. M. Pavon having had the politeness to shew us a drawing of this tree, carefully made under the inspection of M. Tafalla, and which will be published in the fourth volume of the *Flora Peruviana*; we have the pleasure of indicating the most prominent specific characters which we have remarked on this plate. *Cascarilla amarilla del rey*, or *Royal yellow Quinquina*, is the name which it bears in the drawing; *foliis lanceolatis glandulosis obscure virescentibus, petiolo nervoque centrali sanguineis, flore rubro*. M. Pavon has informed us that this bark detaches easily from the wood, and that the most experienced barkers distinguish it by this separative character. Some days after the extraction it is not to be distinguished from that of No. 2; when it is fresh gathered the colour of the internal surface is of a greenish white, which soon changes into a faint yellow, augmenting in intensity until the desiccation is complete. The tree or shrub which produces it is of the same height and exhibits the same structure as that of the red; yet M. Tafalla designates them in his drawings as forming two different species.

† M. Pavon having had the politeness to shew us the drawing of this shrub, we have recognised in it the following characteristics: *C. foliis lanceolatis glandulosis, petiolo nervoque centrali sanguineis, flore rubescente*. The two drawings appeared to us so similar that we found only a slight difference in the colour of the flower, and were unable to discern on what character their specific difference could be established.

At the moment of extraction this bark assumes internally the colour of saffron, though rather livid; during desiccation its colour heightens, and approaches more or less to that of Ceylon Cinnamon. The shrub grows to the height of about three yards. The trunk is generally single, and covered with a rather rough bark. M. Pavon has informed us that this bark adheres more to the wood than the former; but it is more compact, and emits some little noise when detached from the wood.

We have remarked in it the following characters: the epidermis thin, but rather thicker than that of the yellow; wrinkled, of a chesnut brown, and covered with silvery flakes and very small lichens; transversal fissures more numerous and very distinct; thickness somewhat less than a line; roundness or rolling complete; fracture clear, with little filaments in the internal part; thickness the same as the former; internal surface not so fine, and of a greyish yellow; no perceptible difference from the former in the other qualities. It is often found in commerce with the Peruvian, the slender, the rough, and others, but forms, together with the first, the assortment most in esteem.

### III. THE PERUVIANA.

THIS is the bark of the *Cascarillo officinalis* of Ruiz, *Cinchona nitida* Flor. Peruv.\* *C. officinalis* of Linnæus, much esteemed, and distinguished by the following characteristics: Fissures orbicular and parallel; surface slightly rough; of a clear grey, on account of the silvery lichens which almost entirely cover it;† the parts not covered by lichens are of a chesnut colour; in thickness from half a line to a line; size from a goose-quill to an inch and a half, according to M. Ruiz; the rolling complete; internal surface of a yellowish red, approxi-

\* *Folii obovatis nitidis, paniculâ brachiâtâ, corollis albo-purpureis, limbo parum hirsuto.* The natives of the country call the trees of this species *Cascarillos finos*. It is the *Quinquina* which was first discovered in the province of Loxa; is much esteemed, and one of those most in request. The tree grows in the mountains of Panataluas, Huanuca, Xauxa, Loxa, &c.; it flowers generally in the months of May, June, and July, and grows to the height of ten or fifteen yards.

† From this circumstance it doubtless derives its name of *Quinacana*, by which it is also known by the inhabitants, to distinguish it from other barks which might be of the same colour.

matings to common Cinnamon; fracture clear, with very few fibres in the internal part. It is in general thicker and more compact than the two former; its bitterness appears rather fainter, but its smell much more perceptible. M. Ruiz regards this bark as the richest in quinic acid, and least disagreeable to sick persons.

We have already observed, that this bark must not be confounded with the *Peruvian* of commerce, the goodness of which depends on the quality of the species of which it is composed.\*

#### IV. THE SLENDER (DELGADA).

THE bark known by the term *delgada* or *delgadilla*, belongs to the *C. hirsuta* Flor. *Peruv.*† Its external surface is rather rough, with small transversal clefts, and is of a clear grey, from the whitish lichens, less silvery than those of the *C. nitida*, by which it is mostly covered. The parts destitute of this covering exhibit a rusty colour, especially when viewed through a good lens; it is remarkable for its fineness, being nearly half a line in thickness and two or three lines in diameter, the fracture clear and resinous, with some extremely small filaments in the internal part; it is well rolled, and has much affinity with the former

\* We have never been able exactly to ascertain what is the *Peruvian bark* of commerce. We have applied to all the druggists in the capital, and can affirm that all the *Quinquinas* they have shewn us have little resemblance to each other. It is even to be found of different qualities at the same druggists. We have often met with thick barks of the good species of Loxa, some smaller barks of the same species, and a great quantity of inferior species.

† *Foliis ovalibus, crassis, margine reflexis, terminalibus, subcordatis, floribus corymbosis; corollis purpurascensibus tomentosis, limbo hirsuto.*

This tree grows to the height of about five yards. Having attained its development, it becomes surrounded with shoots springing in a vertical direction from its root, and forming with the principal trunk an oval surface with the appearance of a dome. It grows in the mountains of Fillao, Acomayo, and other places of Panatahuas.

in bitterness and aroma. It is generally found mixed with other fine species, but is very rare.\*

## V. THE LAMPIÑA.†

THIS is the name given by Ruiz to the *Cascarilla bobo*‡ of Peru, or to the bark of the *C. lanceolata*, *Flor. Peruv.*|| It is distinguishable by its thickness, from one line to two, according to its bulk, which varies from that of a goose-quill to an inch and a half; it is well rolled, and slightly rough on its external surface; the epidermis very fine, and cracked; of a sallow colour, with spots more or less bright or dark, proceeding from some farinaceous lichens; the internal surface rather rough and of a pale red; the fracture clear and easy in every direction. This bark is readily discerned when mixed with the former, not only by its colour and thickness, but also by its bitterness, which is much more considerable, and approximates to that of the *Calisaya*;§ its smell is not very perceptible. It occurs very commonly in the Peruvian of commerce.

\* The cause of the rarity of this bark is its extreme fineness. The *Cascarilleros* have little interest in procuring it, as a day labourer within the same period might obtain eight times more in quantity of *Peruvian* than of the *Delgadilla*.

† The word *lampiña* may be rendered by that of *glabra* used in the same sense by botanists.

‡ The word *bobo* is equivalent to that of *fool* or *booby*. The inhabitants have given it this name because, having the same good qualities as the other *Quinquinas*, it has not their colour. The tree flowers in the months of May, June, and July, and grows generally to the height of ten yards; its habitats are the woods of Cochero, Pillao, &c. Its bark is received in commerce when mingled with that of the *Delgada* and the *Peruvian*. It is also known by the name of *Cascarilla amarilla de muño*.

|| *Folius lanceolato-oblongis glabris, paniculâ brachiata magnâ, floribus sub-corymbosis, corollis roseo-purpureis: limbo hirsuto.*

§ M. Ruiz formerly thought that the *Calisaya* was only the internal bark of the *C. lanceolata*, perhaps on account of their resemblance in thickness, bitterness, and other charac-

## VI. LAGATIJADA (LIZARD-COLOURED).

THE species to which this bark belongs is not known, and M. Ruiz has not mentioned it in his *Quinologia*. Yet he has given us specimens\* by which to recognise it, and he regards it, with those who trade in it, as one of the species peculiar to the province of Loxa. We have compared it with the preceding species, and have found that the Yellow is that with which it has most affinity by the fineness of its epidermis, its size, its thickness, and its colour, as well as its bitterness and smell; but the internal surface is of a less lively colour, and has less of the velvet tact; its fracture is entirely ligneous. If this bark is to form a separate species, it will be easily distinguished from the other species of Loxa, and particularly from the Yellow, by this striking characteristic, and by the colour of its epidermis. In the common Loxa which some druggists have shown us, we have found a considerable quantity of this bark.†

Such are the *Quinquinas* which are sold singly or mixed, under the name of Loxa, and which are at the same time the most es-

otics: but the great difference observable in the thickness of the epidermis of these two barks must render the identity of the species very doubtful. It appears that the botanists of Peru now agree in regarding these two barks as belonging to two different species; and M. Ruiz is of the same opinion.

\* When we undertook to describe the *Quinquina* of commerce, we were aware of the difficulty, or rather the impossibility, of establishing the distinctive characters of the species according to their barks. M. Ruiz, to whom we communicated our project, has had the goodness to give us samples of all the barks which in his opinion belong to the species of the genus *Cinchona*, with the names given by the natives to each species, and those of commerce, as well as his opinion on their febrifuge qualities. We have also consulted his *Quinologia* for all the species of which this learned botanist has given a description.

† The chests sent to us from America, instead of a single species of *Quinquina* which each ought to contain, are filled with two, three, and often a greater number of different barks. This abuse has augmented in proportion as good barks have diminished, and as discoveries have been made of new or pretended new species.

teemed and in greatest request. We have observed that the *Delgada* is very rare, and that the two last species, which are reputed to be of an inferior quality, are easily distinguished; that of No. 5 by the size and bitterness of its bark, and that of No. 6 by its entirely fibrous fracture. Hence it results that the fine *Quinquina* of *Loxa* is reduced to one of the three first species, or to a certain mixture of their barks, and that it may be designated by the following characteristics: Size, that of a goose-quill, or nearly; thickness less than a line; surface slightly rough and a little wrinkled with or without circular fissures; the epidermis fine, of a sallow colour more or less dark, spotted with lichens or mucors of a silvery or greyish hue; internal surface smooth or velvety, of the colour of ochre bordering on yellow or red; the rolling perfect, the fracture clear, with some little filaments on the internal part only; taste bitter, rather aromatic, and styptic, without being disagreeable or nauseous, the bitterness manifesting itself gradually on mastication; the smell, that which is peculiar to good *Quinquinas*.

M. Zea thinks that a good distinction may be deduced from the heightening of the colour when the barks are moistened; but no one can be ignorant that all dry vegetables are heightened in colour when moistened, and we are of opinion that no useful deduction can be made from a quality common to all vegetables.

We shall specify the chemical qualities of each bark when we state our analyses.\*

\* We may just observe by the way, that M. Zea believes that the authors of the *Flora Peruviana* have done wrong in making four species of two varieties of the *C. cordifolia* of Mutis. The *C. hirsuta* and *ovata* would form, according to him, one of the two varieties, and the *C. purpurea* and *micrantha* the other; it is only necessary to read the descriptions of Messrs. Ruiz and Pavon to see that M. Zea's supposition is groundless.



## CALISAYA.

THE species to which this bark belongs is unknown in Spain. It is merely presumed that M. Bezares, a botanist attached to the expedition of Peru, discovered the trees of it in the mountains of Monzon, but the descriptions and the samples have not yet arrived. We have observed that M. Ruiz says in his *Quinologia*, that the Calisaya might be only the bark of the *C. lanceolata*, or *lampiña*, stripped of its epidermis; he has reverted to this opinion after the notes which he has received from his successors in America. M. Zea, who finds everywhere the Quinquina of Santa Fe, pretends that it is no other than a mixture of the orange-coloured and yellow of Mutis.\* This is not the opinion of the botanists of Peru, who regard the Calisaya and the orange-coloured as species entirely distinct.

We shall not enter into the discussions of these learned gentlemen. It is not for us to pronounce on the botanical definitions of the species circulating in commerce; our object is to describe them, and to collect, with regard to arrangement, the opinions of those who have a right to give them in consequence of their long botanical excursions on the mountains where the Quinquinas grow.

As the Calisaya is sold in commerce under three different names, and as the three barks, which appear to us to possess different characters, belong, according to the opinion of Ruiz, to

\* It is really extraordinary that, while the enthusiasts of Mutis regard the orange-coloured Quinquina of Santa Fe as extremely rare, they meet with it in a great number of common barks; they tell us, on the one hand, that scarcely in a thousand trees of Quinquina is to be seen one of this species, and then they find it in every direction. May not this contrariety be the result of a little ill humour among some of the members of the two expeditions?

three species, we shall describe them, separately, under the names which they bear in commerce; that is to say, *Calisaya arrollada*, *Calisaya de Plancha*, and *Calisaya de Santa Fe*.

I. *Calisaya arrollada* (or rolled *Calisaya*) known also by the name of *Calisaya de Quito*.

Its epidermis a line and a half thick, rough, almost tasteless, dark tawny colour, with some whitish spots and deep circular clefts, through which are often perceived traces on the liber or inward rind; the large barks are half rolled, and the small ones entirely. Destitute for the most part of epidermis, it presents a smooth surface of the colour of ochre inclining to yellow; its internal colour inclines somewhat more to orange; the rolled barks are in general more compact than the others; the fracture is almost equal on both sides, with some very small fibres; the epidermis is quite resinous; its odour is very faint; it is less aromatic and styptic than the *Quinquina* of *Loxa*; but much more bitter. This bark appears in most respects to resemble that of the *C. lanceolata*.

II. *Calisaya de Plancha*.

A very thick bark, known also by the name of *Cortezon*\* (thick bark) and of *Cascarilla Callisalla* by the inhabitants of La Paz. It is generally met with in large flat pieces commonly two lines in thickness and one or two inches long, some slightly curved, almost always destitute of epidermis,† and thus

\* M. Ruiz has described only the *Cortezon* in his *Quinologia*; but he has given us three different samples, and the barks to which they belong are sufficiently common in commerce.

† The *Cascarilleros* would not find room for their barks if they were stripped of their epidermis. To extract the barks in such a state as they are demanded in commerce, it is neces-

presenting a very smooth surface. Its fracture is very unequal, with long fibres extending into both the pieces separated, and which are more distinct in the inner part; it is also less compact than the former, particularly in the interior. When it is pounded, a very fine, fibrous, and subtle powder separates from it, which penetrates the pores of the skin almost in the same manner as the fibres of the *Dolichas pruriens*. Under the pestle it yields a faintly-yellow powder, abounding in small fibres.\* The genuine Calisaya is much esteemed; it is administered alone, and produces good effects. Practitioners say that mixed with the Quinquina in the proportion of one part to three, it produces much more certain results. In this manner it was latterly employed in the royal pharmacy.

### III. *Calisaya of Santa Fe.*

The name of *Calisaya de Santa Fe* has been given to the thick barks of a yellow Quinquina of that kingdom, very inferior in quality to the Calisayas of Quito and La Paz. It occurs in commerce mixed with the barks of the orange-coloured Quinquina, and of two other yellow Quinquinas of the

sary to leave all the intermediate stripes, which in the sequel of the operation are deprived of a part of their epidermis towards the edges. By these means a considerable portion of the bark remains attached to the branch, and is rejected as useless. This loss is the more to be regretted, because it is almost certain that the epidermis has no influence on the febrifuge qualities of the Quinquina.

The epidermis of the *Calisaya* is thick, rough, and of a reddish brown covered with whitish lichens; its fracture is clear and resinous; it is easily reducible to powder, which is of a deep red, presenting no fibres and having no taste. The facility with which it separates from the rest of the bark will allow an exact analysis of it to be made. It is little esteemed, and for this reason the barks are stripped of it.

\* This bark is very pliant, and the fibres resulting from its separation render its perfect pulverization by the mortar very difficult; it is much better operated on by the mill.

same place. It is known by its yellowish colour, and especially by the facility with which it is bruised, or, as we may say, pulverized, between the fingers. Its fracture is quite ligneous, and discloses in the interior a whitish fibre, whilst in good Calisaya this circumstance is scarcely perceptible.

The bitterness of the Calisaya is developed almost instantaneously and in all its intensity, whilst in the Quinquinas of Loxa the bark requires to be chewed and macerated in the mouth. This bitterness continues long after mastication, and is accompanied with a certain disagreeable taste which excites nausea. The rolled Calisaya is less disagreeable, though not less bitter, and appears to us to have a little smell.

#### IV. *Quinquina resembling the Calisaya.*

M. Tafalla has sent from Peru some specimens of a new Quinquina. Under this denomination, and under that of *Cascarilla provinciana*, he collected this bark in the woods of Chicoplaya. The same species also occurs in the mountains of Monzon, which belong to the province of the Huamalies, and the discovery of it is to be ascribed to M. Bezares.\* This bark has a perfect resemblance to the orange-coloured Quinquina of Mutis, and Messrs. Zea and Ruiz are rather inclined to believe that they may belong to the same species.

\* It is said that M. Bezares discovered at Monzon this species of Calisaya; it is also said that he discovered at Monzon a Quinquina similar to the Calisaya, and which is thought to be of the same species with the Red Quinquina of Mutis. It is possible that in the discovery of the Calisaya, which is ascribed to Bezares, the question may be only on the discovery of this new Quinquina resembling the Calisaya, which, according to M. Ruiz, is very different from the Calisaya, as well as the orange-coloured Quinquina of Mutis. This doubt can be cleared up, only by the arrival of the specimens which M. Tafalla is to send.

### CASCARILLA ROXA (RED QUINQUINA).

It is supposed that this species was discovered in 1785 or 1786 at Riobamba, Cuença, and Jaen.

This Quinquina, more known in France than here, circulates very little in the interior commerce of Spain; it is used by only a very small number of practitioners. When it arrived from Lima for the first time at Cadiz, the dealers of the latter place paid little regard to it, and it was purchased by the English, and sent to England. Sir Joseph Banks wrote some time afterwards to Professor Ortega, to apprise him of the good results obtained from it, and to request some information on this new bark. Several known species are comprised under this name.

#### I. *Genuine red Cascarilla.*

This is the red Cascarilla of Ruiz, the red Quinquina of the French and English, the vermillion Quinquina of the Portuguese. It grows, as we have stated, in the mountains of Riobamba, Cuença, and Jaen, on very elevated spots, cool at night, and well exposed to the sun, as do all the other fine species. Its exterior surface is rough and furrowed with very distinct transversal fissures;\* the epidermis of a sallow colour more or less dark, with whitish spots produced by lichens and mucors; the internal surface dark red; the thickness one or two lines; the bulk from one inch to two inches and a half; the small barks are well rolled, the large ones little or not at all; these three

\* The inspection of the plates sent by M. Tafalla to Messrs. Ruiz and Pavon, proves that the principal transversal fissures are owing to the insertion of the leaves and stipulæ; their proximity might form one of the characteristics for distinguishing the young shoots.

last characteristics of the Calisaya have much analogy with those of the rolled Calisaya and of the Calisaya de Plancha: the fracture of the smaller barks is clear, that of the larger somewhat fibrous, particularly in the interior; the smell agreeable, like that of the fine Quinquinas, and very perceptible on pulverization or decoction; the taste sufficiently bitter, aromatic, styptic, without being nauseous. The species is unknown.

III. *Cascarilla of flowers of Azahar*, (orange flowers,) *Cascarilla amarilla* of Ruiz, *C. magnifolia* Flor. Per., *oblongifolia* Mutis.\*

The exterior surface smooth and covered with mucors, which give it an aspect much like the bark of the poplar; the internal surface reddish, but internally it assumes a stronger tint in proportion as the parts approach the epidermis; the thickness is of a line or somewhat more; the bulk from that of a goose-quill to an inch and a half; the rolling of the small barks entire, that of the large ones nearly so; fracture unequal, with not very long fibres on either part; smell agreeable, and perceptible only on mastication or decoction; the taste an agreeable bitter, and rather styptic; not very compact. This Quinquina, little or not at all used by Spanish practitioners, is sent abroad, and particularly to northern countries; it is probable that the epidermis is separated, which hinders its sale on account of its co-

\* *Foliis oblongis ovalibus glabris, paniculâ brachiâtâ, floribus sub-corymbosis, corollis albis: limbo villosis.*

This tree is one of the largest of the species. Its largest leaves are a foot long, and more than half a foot broad; the surface of the barks is always smooth; it grows in the mountains of Panatubus towards Cuchero, Chinchao, Chacaluassi, and Puruzu; in well-sheltered and low situations. This species is found also in Santa Fe, and is designated by the natives by the name of *Azahar*; it was denominated by Mutis *C. oblongifolia*. In 1778 M. Ortega sent some specimens of it to the Royal Society of Medicine at Paris.

lour. An extract is obtained from it which is in considerable repute, and much used in putrid fevers.

### III. *Red Cascarilla of Santa Fe.*

M. Ruiz has transmitted to us a sample under the peculiar name of Red Quinquina of Santa Fe, and which he does not confound with the former. Its colour partakes rather more of the tawny, its fracture is cleaner on the exterior edge, and with long fibres on the interior. Its taste has something disagreeable, which is not perceptible in the former.

### IV. *Cinchona laccifera* of Tafalla, vulgò *Socchi*.\*

M. Tafalla, who discovered this species, sent the barks of it to Europe in 1798; they are the highest in colour of all those that circulate under the name of Red Quinquina. This new Quinquina is more in repute in respect to its febrifuge qualities; Ruiz places it among the inferior barks.

A thick spongy bark; the external surface rough with annular fissures more or less approximated; the epidermis very slender, of a tawny ash colour of different shades, the internal surface darker, of a colour resembling carmine or lake; the interior of the bark tawny, resembling rhubarb; thickness from two to four lines; specific gravity considerable notwithstanding its spongy appearance; fracture resinous on the exterior, bordered

\* This tree grows in the lower woods and in the valleys of Chicoplaya. Its bark is known by the inhabitants under the denomination of *Socchi*. The extract obtained from it is of a high colour and transparent. M. Tafalla says, that on scraping the internal surface of the fresh barks a juice is obtained, which inspissated in the sun serves as a substitute for lake. A specimen of this inspissated juice has been sent from Lima to M. Ruiz, by Father Gonzales, under the name of *Laca Cinchonica*. It is conjectured that the tree may belong to a new genus, between *Macronemum* and *Portlandia*, and materials are expected from M. Tafalla which will decide this question.



with small slender points on the interior; the odour of Quinquina extremely faint; flavour slightly bitter, and styptic without being nauseous. It is very little rolled.

#### V. *Cascarilla del Rey* (Royal Cascarilla).

The species to which this bark belongs, which is sold also under the name of red Quinquina, is still unknown. We shall give a description of it according to the specimens of M. Ruiz; he does not speak of it in his *Quinologia*. This bark, like the preceding ones, occurs in large and small pieces, the latter well rolled, the others only half, both pretty fine; none are found exceeding a line in thickness. Its epidermis is also very fine, tawny, greyish and smooth; internal surface ochrey inclining to red; its fracture clear, with a few fibres towards the interior edge; its flavour styptic, and more disagreeable than bitter, with little or none of the aromatic odour peculiar to good Quinquinas. This bark presents on the internal surface almost the appearance of genuine red Quinquina; but externally it resembles the bark of the cherry-tree.

The genuine red Quinquina is readily distinguished from the other false or real Quinquinas that are sold under the same name. The second, third, and fifth, have an extremely smooth surface; the epidermis greyish; and there is not that uniformity of colour in the internal parts which is observed in the red Quinquina, which scarcely, even in the thick barks, presents a greyish shade. All these Quinquinas, moreover, either have the taste and smell of the first in a faint degree, or have a nauseous flavour. As to the bark of the *C. laccifera*, it is so thick,

and its colour so striking, that it cannot be in any way confounded with the *roxa verdadera Huanuco*.\*

The Quinquina to which the name of *Huanuco* has been given, was first known in Spain in 1799, and was brought by the frigate *La Vilez*, which landed 180 chests of it at Santander. M. Ruiz, who was appointed to examine this cargo, found in the chests a thick bark, till then unknown to the botanists of Peru, mingled with the barks of the *C. nitida* and the *C. lanceolata*, and with those of the species which Tafalla has designated by the term *similar to Calisaya*. He concluded from this mixture, that the *Huanuco* must be regarded as a new Peruvian species, and that, united with other barks in certain proportions, it might compose a powder of middling quality. The subsequent missions were not so carefully attended to; for M. Ruiz discovered in them a quantity of barks of inferior estimation to the former. On all these barks we are about to treat, commencing with that which has been particularly designated *Huanuco*.

I. *Large Bark, designated particularly by the name of*  
*HUANUCO.*

The surface very rough, with transversal fissures near each other; some lichens; epidermis pretty slender, blackish, and almost tasteless; it separates easily from the bark in small scales;

\* The quantity of Quinquina obtained annually from Peru, or which is wasted by the bad method of extracting the bark; the custom of felling trees without providing a substitution of them, instead of stripping them in part and profiting by new shoots;—these constitute the principal cause of the scarcity of the fine species, and of the introduction of a great number of new species which the Cascarilleros think proper to introduce, without having any idea of botany, and in the mere routine of their station, frequently even in subservience to their interests. It is the principle of commerce to turn all to advantage, and we are inundated

the internal surface has a fibrous appearance, of a yellow colour sometimes light and sometimes deep, occasionally reddish; thickness from half a line to a line and a half; bulk from half an inch to three in circumference; odour that of the good Quinquinas but very slight; bitterness inferior to that of the Calisaya, somewhat styptic and nauseous; fracture considerably clean on the exterior edges of the two pieces; but entirely ligneous within. This bark is tolerably well rolled, sometimes the two sides roll separately and unite in the middle. It is thought that the materials and observations expected from M. Tafalla may afford means for determining this species.

## II. *Cascarilla ferruginea* (iron-coloured).

Well characterized by the name which it bears in commerce, having internally and externally the colour of ochre; this colour is more or less lively in the internal parts of the bark. The external surface rough and more than wrinkled; the epidermis tawny, slender, adhering very well to the bark, and filled with numerous transversal clefts; internal surface ligneous; fracture very clear towards the exterior edges, but very ligneous internally; it breaks with difficulty, and is with difficulty bruised between the teeth. In its other characters it resembles the slender barks of Huanuco, but is less bitter and more nauseous. The species to which it belongs is still unknown. The *Huanuco* of commerce is mostly composed of this bark.

with unknown barks and mixtures, which render distinction almost impossible. Of all the mixtures, the least in consideration is that generally found under the name of *Huanuco*. It has sometimes portions of good species, the barks of the *C. nitida* and *lanceolata*, as M. Ruiz and others have remarked in the expedition of Santander in 1799; but most frequently the chests contain only barks in little repute, and almost the very refuse of commerce.

### III. *Cascarilla claro-amarilla*, or *Quinquina* of a clear yellow.

This bark, of which the species is unknown, greatly resembles the orange-coloured *Quinquina* of Mutis. The epidermis is thin, covered with some whitish lichens, and easily separable from the rest of the bark; the colour yellow slightly partaking of red; it is of a faint bitter and considerably styptic without being nauseous: in its other characters it resembles the *Calisaya*; but is easily distinguished by a much weaker bitter, and by the fineness of its epidermis; it is often found with the *Huanuco*.

### IV. *Cascarilla pagiza*.

This is the bark of the *C. ovata*, Flor. Per.\* Not being received in commerce, they mingle it with the *Huanuco* and other barks; but it is chiefly employed in forming the extract which is sent from Peru. When used alone in the extract of Panao, it yields a stronger bitter than that of the *C. magnifolia*, but not so transparent.

M. Zea thinks that the yellow *Quinquina* or *C. cordifolia* is the same species; but M. Ruiz, though of the same opinion, is yet disposed to believe that the specimens and barks of the *cordifolia*, upon which he has founded his opinion, having suffered a little in the carriage still leaves some doubts as to this identity.†

\* *Folius ovatis subtus tomentosis, panicula brachiata, floribus sub-corymbosis, corollis purpureis: limbo hirsuta*. It grows in the woods of Puzuzu and Panao, flowers from June to October, attains the height of ten yards, and is remarkable for the size of its leaves after the *magnifolia*.

† The difference of the specific names given on the spot by the authors of the *Flora Peruviana* and by Mutis, seems to confirm the doubt of M. Ruiz.

The surface smooth; the epidermis fine, whitish, on account of the lichens which cover it; the other parts of the bark of a dark red, and deeper than that of the Cinnamon of Manilla; about a line in thickness; the size from a goose-quill to an inch in circumference or rather more. This bark is well rolled, spongy, easy to break, and presents long fibres on the two separated edges; its bitterness is slight but agreeable; it is also sufficiently styptic; it exhales an odour on decoction.

V. *Cascarilla boba de Hojas Moradas* (Mulberry-leaved).  
(*C. purpurea*, Flor. Per.)\*

This species grows in the mountains of the Panatahuas and of Huanuco: its bark is not received singly in commerce. It has been found mingled with those of the three species denominated *nitida*, *hirsuta*, and *lanceolata*, frequently also with the Huanuco of commerce. Some practitioners place it among the most efficacious barks; but M. Ruiz considers this decision too hasty, and not yet confirmed by experience. The following are its distinguishing characters:

Surface smooth, in some cases rather rough, covered with little lichens; the uncovered parts of a tawny colour more or less clear; the internal surface yellow inclining more or less to red; rarely a line in thickness, and commonly less than an inch in circumference; easily broken, but not very spongy; fracture rather clean, only a few small fibres in its internal part; commonly well rolled, considerably bitter, aromatic, and strongly styptic; it exhales a strong odour on mastication and in decoction.

\* *Folius oblongo-ovalibus ovatisque purpurascens, panicula brachiata magna, floribus sub-corymbosis, corollis albo-purpureis: limbo hirsuto.* Its bark is much sought in commerce, and is in considerable repute among practitioners.

#### VI. *Cascarilla leonado obscura* (dark tawny).

A bark of an unknown species very commonly met with in the Huanuco. It has obtained the name of *leonado obscura* from its greyish-brown colour both on the epidermis and the internal parts; the colour is darker within; it approaches in some characters to the Pagiza; but it has a strong disagreeable taste, which with the colour is sufficient to distinguish it from the Pagiza. It grows on the mountains of the Huamalias and of the Panatahuas; is regarded as a Quinquina of middling quality, and is not described by M. Ruiz.

#### VII. *Cascarilla melada* (honey-coloured).

A species also unknown, and not described by M. Ruiz. Its bark is pretty thick, and well rolled; its external surface rough, of a reddish grey, cut in transversal and very deep slips, and clothed with an epidermis of half a line or nearly in thickness, which separates easily; its internal surface is rough, of a yellow red and unequal tint; it is strongly bitter, styptic, and very disagreeable when masticated.

#### VIII. *Cascarilla fulva*.

It is said that this species was discovered by M. Tafalla, but the specimens and description have not yet arrived. Its bark is one of those which occur most commonly in the Huanuco.

Barks well rolled, and bearing much resemblance to those of the *Cascarilla amarilla* of Loxa in colour and thickness; but they are easily distinguished and recognised, as being very considerably styptic, and as having a very faint bitterness and smell: there is nothing disagreeable in their taste. M. Ruiz places this species among the middling Quinquinas.

## OTHER SPECIES,

MORE OR LESS KNOWN IN SPAIN.

*Cascarilla naranjada de Santa Fe. Cinchona lancifolia* of Mutis, *C. tunita* of Lopez,\* *angustifolia* of Ruiz and Pavon.†

The specimens brought by M. Lopez from America on his second voyage to Spain, under the name of *C. tunita*, belong undoubtedly to the same species which Mutis has designated under that of *lancifolia*; for M. Zea, who has so often seen the

\* M. Lopez says that the discovery of the tree to which this bark belongs was made by him in 1776 at Santa Fe. Messrs. Ruiz and Pavon have given a botanical description of it according to the specimens of M. Lopez.

† *Foliis lanceolatis angustis, marginibus retroflexis, pedunculis axillaribus trifidis, laciniis tri-septemfloris. Habitat in Sanctæ Fidentis regni sylvis, civitati confinibus, unde D. D. Sebastianus Lopez in Hispaniam exemplaria sicca asportavit. Ruiz Suppl. Quinologia.*

Great discussions have taken place on the qualities of this Quinquina, its discovery, the time when it came into use, &c. between M. Ruiz and his pupil, and the pupils of M. Mutis, among whom we remark M. Zea. The latter regards this Quinquina as the most ancient and the most rare; yet M. Mutis, in speaking of the first Quinquina that was used, says nothing of its species. Early authors only say that the bark had a red colour similar to that of Cinamon, which may equally apply to some species of Loxa, and to the orange-coloured Quinquina of Mutis. As to its febrifuge and balsamic qualities, experience alone can pronounce upon them. We shall refer, by the way, to what Don Gregorio Banares, a Spanish chemist, and a stranger to the discussion which has arisen between Zea and Ruiz, says of the fine Quinquinas of Santa Fe: "The effects of these Quinquinas have not answered the wishes and exaggeration of the author; and their principles, except the red Quinquina, are not the same with those of Loxa and the Calisaya; the orange Quinquina does not affect animal jelly; the yellow does not decompose the jelly, but, as well as the white, often turns the solution of sulphate of iron green." We intend to repeat these analyses, together with those of the other Quinquinas.



latter on the spot, could scarcely remark any difference in the size of the leaves.

Surface rough, split transversely, and covered with mucors of a clear tawny colour with some blackish spots; internal surface more or less orange-coloured, pretty well rolled, from half a line to a line in thickness, and from half an inch to an inch in circumference; fracture fibrous, the two fragments being crowned with little longitudinal fibres; it is with some difficulty frangible, though the circumference is spongy; its smell is faint, and very perceptible on pulverization or decoction; the bitterness sufficiently manifest and not agreeable; not styptic.

Considerable resemblance exists between this bark and that of the species discovered by Tafalla at Chicoplaya, of which we have previously spoken. The only difference is, that the barks of the latter are cloven both transversely and longitudinally, presenting more inequality in size and thickness, and more irregularity in the colour of their internal surface; in other respects they are the same.

*Quina blanca de Santa Fe. C. ovalifolia* Mutis.

M. Vahl has published the white *Quinquina* of Santa Fe under the specific name of *macrocarpa*,\* according to the specimens of it which he received from Professor Ortega of Madrid. The barks of the *macrocarpa* have a greyish epidermis, very fine and soft to the touch; the internal surface yellowish, smooth, shining, and furrowed; the interior of the bark of a greyish yellow; thickness from a quarter of a line to a line; they are rather spongy internally and in flat pieces; they crack easily between the teeth, and readily dissolve in the mouth, which, perhaps, causes them to be regarded as very *saponaceous*, slightly

\* *C. macrocarpa, foliis oblensis, subtus pubescentibus costatis, Vahl.*

styptic, and of a very perceptible though not agreeable bitterness. M. Pavon believes that the *macrocarpa* does not belong to the genus *Cinchona*. This *Quinquina* is little valued in Spain, and is not current in commerce.

*Asmonich.*

This is the name given by the natives of Puzuzu and Muna to the *C. fusca* of M. Ruiz, which is, according to M. Zea, the *C. rosea* of the *Flor. Per.*\*

Surface smooth; epidermis a clear grey, with spots more or less dark; the interior of this bark is of the colour of chocolate, very little or not at all rolled in consequence of its extreme aridity; in thickness half a line; breadth an inch or nearly; very light, fragile as glass, without leaving any fibrous trace; a faint odour of *Quinquina*, very little bitterness, but a very strong and peculiar stypticity.

*Cascarilla baya* (bay Cascarilla).

M. Ruiz has made known to us this bark, which comes from Santa Fe, and which must not be confounded with the *cordifolia* of Mutis, though it has a little affinity with it in colour. It has a fine epidermis, sometimes tawny, sometimes grey, and at other times a greenish grey; its colour is of a yellowish tawny; it is well rolled, has a clean fracture with some little fibres in the internal part only; its bitterness is slight, but rather agreeable, as well as its smell.

\* *Foliis oblongis obtusè acuminatis, paniculâ brachiâtâ, floribus corymbosis, corollis roseis: limbo margine tomentoso.* It is one of the rarest species; we have not been able to procure its bark. It is described by M. Ruiz in his *Quinologia*. The Indians use its flowers to adorn their pagodas.

In 1805 and 1806 there were considerable quantities in the commerce from America; connoisseurs regard it as one of the best yellow Quinquinas.

*Cascarilla amarilla de Jata.*

This yellow Quinquina is frequently received without admixture; it much resembles the *pagiza*.

Its epidermis is very fine and of a reddish grey; external surface smooth; internal surface rough and of the colour of ochre; difficult to break; fracture clear; slightly bitter without being disagreeable, very little aromatic, in considerable repute.

---

## QUINQUINAS

RECENTLY DISCOVERED BY TAFALLA.

---

### I. *Cascarilla de hoja aguda. C. angustifolia*, Flor. Per.\*

Its bark is designated by the following characters: Surface rough with transversal fissures more or less deep; epidermis fine, very adhesive, of an ashy tawny, with whitish and blackish spots,† internally of rather a darker red than that of Manilla Cinnamon; of the middle size. The thickest barks are nearly an inch in circumference, and the smallest are of the size of a goose-quill; thickness a line or less; fracture easy with some fibrous filaments; taste bitter, styptic, and nauseous; smell faint and disagreeable. This bark is not much rolled, and is in little repute; it is found mixed in considerable quantities in the chests of common Quinquina brought from America, or compounded by the Europeans after their manner.

\* *Folius ovatis acutis, paniculis terminalibus brachiatis, corollis candidis glabris.* It grows in the lower woods of the Andes of Peru near the River Taso; flowers in the months of April, May, and June.

† This character readily distinguishes when it is mingled with barks of red Quinquinas; and its nauseous taste decidedly separates it from the Quinquinas of Loxa, with which its fineness and even its internal colour might cause it to be confounded.

## II. *Cascarilla negrilla* (blackish).

This is the *C. glandulifera*, Fl. Per.\*

Surface rough with some slight transversal fissures; epidermis greyish with some tawny and blackish spots; the parts destitute of epidermis of the colour of rust; internal surface of a pale yellow and rather smooth; size small, less than that of a goose-quill; thickness below half a line; fracture easy, and crowned with small parallel fibres; bitterness sufficiently perceptible, slightly aromatic and extremely styptic, but not disagreeable; odour faint and agreeable as in the good *Quinquinas*. It frequently appears among the *Quinquinas* of Loxa; and is easily known by its spotted surface. M. Tafalla having sent specimens and samples of these two barks, they have been well described by the authors of the *Flora Peruviana*.

## III. *Cascarilla aharquillado*. Dichotomous.†

In 1797 M. Tafalla sent from America the specimens of this new species, but he forgot the barks. This *Quinquina* is much esteemed at Chicoplaya, and is classed among the fine species.

\* *Folius ovato-lanceolatis supernè glandulosi, paniculis sub-corymbosis, corollis albo-roseis; limbo intus lanuginoso.* It grows in the Andes of Peru, in the woods of Chicoplaya and Monzon; attains the height of three yards only; flowers in February and March. Its bark is ranked among those of middling quality, according to M. Ruiz.

† *C. dichotoma, foliis oblongo-lanceolatis, pedunculis terminalibus dichotomis paucifloris, capsulis angustis linearibus longis*, Flor. Peruv. Five yards in height; is found in the woods of the Peruvian Andes; flowers from January until April. Its bark is in little esteem; M. Tafalla gave it the specific name of *pauciflora*.

IV. *Fine Cascarilla of Chicoplaya, de Flor pequena*  
(with small flowers).\*

The specimens arrived with those of the former species, but without the bark. This new species is much esteemed where it grows.

The bark of the *C. Caribæa* of Jacquin is not used in Spain. It is thought that this might form a new genus between *Cinchona* and *Portlandia*.

Lastly, we shall just observe that the botanists of Peru think that the *C. corymbifera* of Forster should be a little better examined on account of its axillary corymbi, a character peculiar to *Portlandia*.

It remains for us to annex a Table of the species lately discovered by Tafalla, and known here by the drawings which he has caused to be carefully executed on the spot, and which he has addressed to the authors of the *Flor. Per.* These botanists have published nothing on the new discoveries, because they are waiting for the specimens and barks which have been sent from America, and which are probably at Cadiz. Being unable to copy the plates, we have noted the most distinctive characters which each drawing has presented to us, in order to give an idea of the new species.

These notes have been made under the inspection of M. Pavon.

\* *C. micrantha*, foliis ovalibus obtusis, paniculâ maximâ, floribus numerosis parvis, corollis albis: limbo lanato, Flor. Peruv. It attains the height of twenty-five yards, and grows in the Andes of Peru, on the side of Chicoplaya.

N.B: In the *Flora Peruviana* is found another species of Quinquina, under the name of *grandiflora*, foliis ovalibus obovatisque subaveniis coriaceis subtus albidis, corymbis terminalibus, corollis magnis; but it appears that it is reserved to form a new genus with one of the species recently discovered by Tafalla.

## Specific Names.

Names current in the Province of Quito, and Botanic Characters.

- Cascarillas con hojas de roble* (oak-leaved).  
 —Fol. ovatis rugosis minoribus.  
*C. pata de galinazo*.—Fol. lanceolatis glandulosis, petiolo nervoque centrali sanguineis.  
*Id. id.* Second species.—Fol. ovatis acuminatis, capsulis sanguineis.  
*C. parecida a la buena*.—It is not known whether this be a species or a variety.  
*C. chahuargaz* (Indian name).—Fol. glandulosis lanceolatis subrepandis, capsulis ovalibus.  
*C. con hojas de Palton* (Pyri indicæ genus).—Fol. lanceolatis glandulosis subtus luteo virescentibus, capsulis ferrugineis.  
*C. crespilla mala* (curled leaved).—Fol. ovato-lanceolatis obscure virescentibus, capsulis ferrugineis.  
*C. con hojas de Lucuma*.—Fol. Lucumæ, capsulis ovatis.  
*Id. id.* Second species.—Fol. subpanduriformibus, capsulis subglobosis.  
*C. de flores grandes y blancas qui huilen la vainilla*.—Fol. lanceolatis obtusis nervosis, floribus albicantibus magnis, capsulis clavatis.  
*C. de hojas angustas*.—Fol. lanceolatis angustis nervosis glandulosis.  
*C. palo blanco* (white wood).—Fol. lanceolatis undulatis venosis: marginibus reflexis.
- C. MICROPHYLLA. {  
 C. VAINILLODORA. {  
 C. ANGUSTIFOLIA. {



Specific Names,

Names current in the Province of Quito, and Botanic Characters.

- C. con hojas rugosas*.—Fol. ovatis integerimis rugosis.  
*C. colorada*.—Fol. inequaliter ovatis acuminatis nervosis glandulosis, floribus internè bicoloribus, capsulis virescentibus.  
*C. crespilla alumada*.—Fol. obovatis nervosis rugosis.  
*C. amarilla*.—Fol. obovatis acuminatis, floribus internè incarnatis.  
*C. ANGUSTIFOLIA*. { *C. crespilla*.—Fol. subrotundo-ovatis: marginibus convexis, floribus into dilutè rubris.  
*C. con hojas poco velludas* (villose-leaved).—Fol. subvillosis glandulosis, floribus internè violaceis.  
*C. negra*.—Fol. floralibus ovatis, floribus internè purpureis.  
*Id.* Second species.—Fol. floralibus subcordatis glandulosis, floribus purpureis.  
*C. rubicunda*.—Fol. ovatis, floribus internè rubescentibus.  
*C. RUBICUNDA*. " { *C. serrana* (growing in the mountains).—Fol. obscure viridibus, floribus obscure rubicundis.  
*C. canelas*.—Fol. cordatis rotundatis maximis, floribus albicantibus maximis, fructu maximo.  
*C. MACROCARPA* " { *Cunas de gato*.—Stipulis revolutis, floribus capitatis conglomeratis.
-

## DESCRIPTION OF THE TREE

KNOWN IN THE KINGDOM OF PERU UNDER THE NAME OF

## QUINQUINO,

AND OF ITS BARK, CALLED QUINQUINA,

WHICH IS DISTINCT FROM THE QUINA OR CASCARILLA.

BY DON HIPOLITO RUIZ.

THE Quinquino\* is a branching and elegant tree, which grows to the height of thirty varas and upwards. The trunk is thick, straight, smooth, covered like the branches with a grey, coarse, compact, heavy bark, granulated, and of a pale straw colour in the interior; filled with resin, which, according as it abounds more or less, changes the colour to citron, yellow, red, or dark chesnut; the smell and taste are grateful, balsamic, and aromatic, resembling those of the Red Peruvian Balsam sold in the druggists' shops under the name of White Balsam. The branches extend almost horizontally. The leaves

\* *Myroxylon peruiferum*. Flor. Per. Mss. cum Icone. *Myroxylon peruiferum* Linn. Suppl. pl. 34 and 233. *Hortus Bot. Mex.* p. 51. Edit. Matr. tom. 1. p. 373.

The description and plate of the *Myrospermum* of Jacq. Amer. 120, tab. 174. fig. 34. compared with mine and with the description of the younger Linnæus, indicate clearly that the *Myroxylon* and *Myrospermum* are species of the same genus. Also the generic notes with which Linnæus forms his incomplete generic character of *Toluifera*, agree with those of *Myroxylon* and *Myrospermum*. My observations lead me to think that those three genera ought to be placed under one only, that of *Myroxylon*, on account of its being the most known and best described.†

† See my remarks on these Genera in Brande's Journal, No. 19, p. 28.—A. B. L.

are alternate, and composed of two, three, four, and sometimes five pair of leaflets, nearly opposite, and ovato-lanceolate acute, but with the apex somewhat obtuse and emarginate, smooth, shining, entire, marked with transparent spots, hairy on the under surface, and with a short footstalk; many leaves terminate unequally, and in this case consist of five, six, or nine leaflets. The common petioles are thickish and hairy. The flowers spring from the scars of the young branches, and from the axillæ of the leaves, in single racemes larger than the leaves; florets sparsely, pedicelled, erect, supported by a small ovate concave flexible bractea. The calyx is dark green, campanulate, divided into five small and nearly equal teeth, but one of them so far separated from the rest as to be found placed under the germen, and they all fall off when the flower withers.

The corolla is composed of five white petals, four of these narrow, equal, lanceolate, and larger than the calyx; the fifth reflexed, broad, and twice the size of the others. The stamina consist of ten filaments inserted into the calyx and inclining to one side; the antheræ elongated, sharp-pointed, and sulcated. The pistil consists of an oblong germen, supported on a curved pedicle, inclining with the stamina to the same side; the style short, subulate, and crooked, and the stigma simple.

The pericarp pendulous, straw-coloured, nearly two inches in length, club-shaped, somewhat curved, globular near the top, and terminated by the curved style; contracted towards the base, and compressed into the form of a rough tube, wrinkled, ductile, thick, furnished with two ribs or edges; the globular part is composed of a single cell, which contains one seed, which is crescent-shaped, projecting from the cell, and between this and the lining of the pericarp is filled with a yellow liquid balsam, which in time dries and becomes as hard as resin.

The Quinquino grows in the mountains of Panatahuas, in the forests of Puzuzu, Muña, Cuchero, Paxaten, Pampahermosa, and in many other countries near the river Marañon, in low, warm, and sunny situations; it blossoms in August, September, and October. The natives of the country call the tree by the name of Quinquino, and its bark and fruit by that of Quinquina, a plant very different from our Quina or Cascarilla: others call the tree also Quinquina, but it is more commonly known under that of Quinquino.

The Indians of Puzuzu and the abovementioned countries do not collect the balsam of this tree: whether it is that they are ignorant of the method of obtaining it and of its value, or because few trees are found in the neighbourhood of their towns, the only parts which they collect are the barks most filled with resin, condensed into drops and lumps, and the fruits, in order to sell them in the neighbouring provinces, both of which are used for the purpose of perfuming cloth and apartments. It is called Perfume of Quinquina, to distinguish it from the true perfume, which is a composition of Benzoin, Storax, and Ambergris, these substances being formed into a paste from which they make pastils.

The fruit as well as the bark being reduced to a coarse powder, they mix with it oil of Maria, Carana, Jacamaca, Lera, or Sebo, and make with it little plasters, which they apply upon the temples and behind the ears to mitigate the pains of the head ache and the tooth-ache, particularly the hemicrania or Jacqueia. It closes recent wounds, strengthens the brain, mitigates the pains proceeding from agues, and dissipates the shiverings produced by fevers.

The other uses and virtues of the fruit, bark, and balsam may be read in the works of Dr. Hernandez.

The balsam of Quinquino is procured by incision at the beginning of spring, when the showers are gentle, frequent, and short; it is collected in bottles, where it keeps liquid for some years, in which state it is called White Liquid Balsam. But when the Indians deposit this liquid in mats or calabashes, which is commonly done in Carthagena, and in the mountains of Tolu, after some time it condenses and hardens into resin, and is then denominated Dry White Balsam, or Balsam of Tolu, by which name it is known in the druggists' shops.

It is generally believed, and M. Valmont de Bomare says in his Dictionary of Natural History, that if an extract be made from the bark by boiling it in water, it remains liquid and of a blackish colour, known under the name of Black Peruvian Balsam. There is no difference in these three balsams, excepting in the name, colour, and consistence.

The wood of the Quinquino is extremely compact, heavy, and durable, but on account of its uneven grain is difficult to fashion into any shape; it lasts for many years without being injured, and is never exposed to the attack of worms; it even remains sound for a long time when placed in wet situations, nor does it crack when exposed to the sun; wherefore the Indians make use of the trunks for beams and stanchions.

A species of sparrow called Poccochyncys, Kenychis, and Hedrondes, make their nests at the extremity of the branches of the Quinquinos, selecting for that purpose the most solitary and slender, without doubt to prevent monkeys, and other climbing animals which mount those trees, from plundering their eggs and preying upon their young. The texture of these nests is worthy of admiration; for, besides the singularity of their resembling the pericarp or fruit of this tree, they form them with such art and neatness, with straw, bark, and other flexible

materials, interwoven in such manner that they resemble purses of trellis work, a vara and a half in size, more or less; and lining them at the bottom with ceibo and other soft cottony substances, they leave them hanging from a branch, a support to all appearance incapable of sustaining such a weight, and resisting the oscillations and movements with which they are continually agitated by the wind. They suffer no other birds, that are not of their own species, to rest on the trees where their nests hang, and they particularly dislodge from them the larger birds and the birds of prey by attacking them.

These birds are called Hedrones, from the smell which exhales from them, and which they leave in their nests. They are called Kenychis, which signifies "adorned," on account of the various colours of their feathers, and Poccochycnys, which signifies "become ripe," on account of that being a word frequently heard in their scream or song, which word has some analogy to their nature; for they always place themselves near fruit on the point of becoming ripe, in such a manner that they seem to watch and guard them until they ripen, and then they pluck them and fly off with them to their young. The Indians, who are not ignorant of this fact, avail themselves of it to mark those places where they come with the fruits, which are commonly plantains, annonas, chirimoyas, papayas, pine-apples, or ananas.

If the Poccochycnys perceive any one picking the fruit, or even coming near them, they give evident signs of their displeasure, flying from side to side, and repeating without ceasing the cry or word Poccochycny, with other unintelligible screams, first in a shrill and quick tone, and afterwards soft, slow, and mournful.

The Poccochycny is a bird of the size of a Polla Galina, with the beak an inch and a half in length, conical, convex, and







*Myracylon Peruvianum. L.*

straight, very sharp, and inclining to a white colour, with two yellow spots in the front of the head. The claws black, with four toes, and the nails crooked; the lower part of the neck is as yellow as the yolk of an egg, the upper part and the wings black, with eyes between chesnut colour and yellow; the rest of the body of a dark chesnut, with the tips of the feathers white. They take short flights; for when they fly highest they do not ascend above 300 toises, forming a curve from the place whence they ascend to the point where they rest; and though their wings are continually in motion, their velocity is not great. Those birds having perched themselves, begin to make the low sound Poccochlycny; they lower their heads, and half-extending their wings, they grasp the branch with their claws, and suspend themselves from it, which movement they make every time they utter the cry: they feed on pulpy fruits. They are found on the mountains of the Andes, in low and warm places near towns and villages. This species belongs to the genus *Oriolus* of Linnæus.

---

EXPLANATION OF THE PLATE.

---

1. A flower magnified.
  2. The curved germen surrounded at the base by the campanulate calyx.
  3. Part of the one-celled pericarpium, shewing the projecting seed.
  4. The crescent-shaped seed.
-

**MEMOIR**  
ON THE  
**GENUINE CALAGUALA,**  
**AND TWO OTHER ROOTS,**

WHICH ARE SENT UNDER THE SAME NAME FROM SOUTH AMERICA.

---

BY DON HIPPOLITO RUIZ,  
FIRST BOTANIST TO HIS MAJESTY IN THE EXPEDITION TO PERU,  
&c. &c. &c.

---

**PRELIMINARY NOTICE.**

**A**T the repeated request of several professors of the three branches of medicine, both in Spain and in foreign states, for copies of the Memoir on the Genuine Calaguala which I inserted in the first volume of the Transactions of the Royal Medical Academy of Madrid, together with that on the *Ratanhia*, *Canchalagua*, and *China Peruviana*, I have been encouraged to reprint it in a separate form. I have added some illustrations, and an accurate engraving from the original drawing, for the more complete description of a vegetable hitherto not sufficiently known to naturalists, and for which reason there have been and are current in commerce many roots of different *cryptogamous* plants of little or no virtue, to the disparagement of the effica-

cious and genuine Calaguala, which casually though rarely reaches Spain ; and if it comes to the hands of druggists and dealers, they unjustly decry it, preferring the roots of a plant of a distinct genus, and of no virtue, as equivalent to the Calaguala ; of which proof will be adduced in the proper place.

---

#### ARTICLE I.

*Of the Calagualas commonly brought to Europe from South America, the origin of their use, and the etymology of their names.*

Little advantage can be derived from the knowledge and distinction of plants, or of any other natural productions, if we neglect the study of their uses and virtues. Nor can any great benefits arise from the knowledge of the uses and virtues of plants and other productions, without previously obtaining a clear and distinct idea of the plants themselves : hence, the observer who would acquire results adequate to his labours and researches, must indispensably unite to the knowledge and discrimination of natural substances, the investigation of their uses, virtues, and properties.

The ancients discovered and were aware of the virtues, uses, and properties of many vegetables and other natural productions, as appears from their writings ; but the little care they took in transmitting to posterity a clear and distinct knowledge of the various species, has occasioned the confusion, obscurity, and doubts, which beset us respecting the objects on which they treated.

The Calaguala, which is one of the simples used for many years past in medicine, is also one of those vegetables which have not been sufficiently distinguished by the Faculty, or even by botanists themselves, much less by dealers and druggists. It is owing to this want of distinction that use is made in medicine, not of the genuine Calaguala, but of the roots of other plants of the same genus, or of others in affinity with it, which never can produce exactly the same effects which are experienced by the Indians and natives of Peru from using the root of the real Calaguala; and hence too proceed the total neglect and discredit into which the Calaguala has fallen among the profession in Spain.

The cupidity of dealers in drugs has probably introduced into medical use the different species of Calaguala, now consumed without any particular use or advantage, to remedy in some degree the injury likely to result to the public from the use of the supposed Calagualas sold by the druggists. I have undertaken in this Memoir to define exactly the three species of roots of the Calaguala, which we receive most frequently and in the largest proportion from the kingdom of Peru.

Though it is very difficult to ascertain precisely the origin and use of the genuine Calaguala,\* exclusive of that which the Indians least civilized and most remote from the track of Europeans make of this root, it may justly be inferred, that the natives already used the Calaguala before the Spaniards entered those

\* Don Diego Perez Bravo, Member of the Royal Medical College of Seville, in a *Botanico-pharmaceutical dissertation* on the *Calaguala*, which he read in the year 1754 before the Royal Society of that city, and which merited the greatest applause, and was printed in the following year, says, that according to the testimony of the most respectable naturalists of Peru, the first discovery of the Calaguala, and of its medicinal use, was made in the province of Caxamalea, (now called Cacamarca,) and that afterwards its use was discovered and diffused through Cuzco, Huamanga, and other districts.

countries, as a sudorific, solvent, deobstruent, and anti-rheumatic remedy. At the present day, not only those Indians who have very little communication and dealing with the Spaniards, but also the Spaniards themselves, and most of the Indians of Peru and people of other castes, make frequent use of the Calaguala for the same purposes.

The dealers, druggists, and professors of medicine include, under the name of *Calaguala*, three species of roots brought from Peru; but the Indians and natives of that kingdom distinguish these three species by very different names, derived, with sufficient propriety, from their respective plants. They call the first and genuine Calaguala, *Ccallahuala*; the second, *Puntu-puntu*; and the third species *Huacsaro*.

The word *Calaguala*, or rather *Ccallahuala*, as it is written and pronounced in the Quichoa or general language of Peru, is derived from the Indian noun *ccallua*, answering in Spanish to a trowel or batten, an iron instrument shaped like the head of a lance, with which the Indian female weavers press the threads of their webs, and from the noun *huahua* in the general language, or *hualas* in that of Chinchaysayo, which in both signifies *boy*; and the words united into *Ccallahuala* signify a *boy's batten*, because children use the leaves of the Calaguala in their sports as battens, from their similarity in shape, and with them imitate the labour which they often see their mothers perform.

The name of *Puntu-puntu*, given to the second species of Calaguala, signifies a thing of many points, because the lower side of the leaves of this species of *Polypodium* is found full of fructifications or orbicular points. Some natives of Peru are also accustomed to call it Lengua de Ciervo, (*Deer's tongue*,) a name doubtless given to it by the Spaniards.

The third species of Calaguala is called *Huacsaro*, that is, a



back covered or masked; because the fructifications entirely cover the lower side or back of the leaves of the plant.

The dealers and traders distinguish them by the names of slender Calagnuala, thick Calagnuala, and middling Calagnuala or *little cord* from its figure. The term Calagnuala is likewise extended to all roots collected from different genera and species of the family of the *Filices* or Ferns, and they pass in commerce as genuine species of the Calagnuala.

In the provinces which I have traversed in Peru, I have not seen or ascertained that any use has been made of the third species of Calagnuala, called Huacsaro, though it occurs in greater frequency and abundance than the other two; but considerable portions of it are brought from Payta and Huayaquil to Lima, destined for Cadiz, whence it is distributed through all the provinces of Spain, and to foreign states.

The infusion or decoction of the *Puntu-puntu* is used as an anti-pleuritic remedy, and it is only in pains of the side that this species is employed. Of the first or genuine Calagnuala frequent use is made in Peru as a solvent, deobstruent, sudorific, and anti-rheumatic remedy; and as such the Indians of the provinces of Canta and Huarocheri bring this species for use from Sierra to Lima, together with various other medicinal plants; and they never return to their homes without having in the course of one or two days disposed of the whole in the neighbourhood; which proves the great use made of its roots, and consequently the effects which they produce, though their virtue is reputed by some persons in Spain and in other parts of Europe to be merely imaginary.

In addition to the three species of Calagnuala of which I treat in this Memoir, collectors are accustomed to procure and mix up with the roots of the first those of other species of *Poly-*



*podium*, so similar at first sight, that the sole difference seems to consist in their *habitats*, and in the different colour and size which appear among them. Yet after repeated examinations and detailed comparisons which I made of all three, notwithstanding the distances at which each of them grows, I resolved to establish them as distinct species, and not as varieties, as I had at first supposed, being misled by the disposition of the leaves. In this respect I relied on the following difference :

The genuine Calaguala, whose fructifications are disposed in two longitudinal lines, placed in quincunx order, as are also the points of the fructifications of these two other species of the *Polypodium*, differs from them both not only in the magnitude and colour of the leaves and roots, and its growing on hills and rocks, in dry chalky soil or in caves, but also in having crooked roots much more fibrous and scaly, ash-coloured, and of easy mastication when dry ; they are of a more intense bitter ; the figure of the leaves is more lanceolate than that of the other two ; the leaves are also different in thickness and consistency, the margins revolute, and the points or fructifications are more rectilinear, without deviating so much from the nerve of the leaf as those of the other two species, which, moreover, grow in warm places, some leagues distant from the hills and wilds, and delight in rich soils or trunks of trees ; they have much longer leaves, rather linear than lanceolate, of softer consistency, less thick, and with entirely flat margins ; the points of fructification, which abound more in these than in the genuine, have not the same regularity in their disposition, some of them deviating from the nerve of the leaf towards the edges, forming occasionally three or four confused lines, and the exterior ones almost always irregular. Though they are distinct species from the genuine, which

is daily used in Peru, they might both, in case of necessity, be substituted for it, in preference to all the other kinds current in commerce, because their roots are scarcely distinguishable from it, in consistency, colour, smell, or taste, though in a less active degree.

Among the multitude of cryptogamous plants which grow in the mountains of the Andes, are found many species of the genus *Polypodium*, which from their single and very entire leaves, more or less lanceolate, are with difficulty distinguishable from each other without minute examination and comparison. In this and in similar cases, it is indispensable that the observer, in order to define well the differences of the species of a genus bearing great resemblance to each other, should avail himself of such comparison, since by defining them separately at different times and places, he is liable to produce almost uniform definitions; and consequently the readers, not finding sufficient marks of distinction, take them for mere varieties of the same species. This may be presumed to have been the case with collectors of the different species of the Calaguala, whose roots are now sold and used indiscriminately in medicine as roots of the genuine Calaguala, of which I have here given a description, explaining the specific difference. I am under the necessity of extending it, by availing myself of the examination and comparison of the *Polypodium Calaguala*, with the other two species nearest allied to it, which during my travels in South America I have observed to be mixed and sold as one species by traders and dealers.

## ARTICLE II.

*Of the Habitats of the three Species of Calaguala, their Collection, and Exportation.*

The situations most favourable to the vegetation of the first or genuine species of Calaguala, are the hills, *punas*, or wilds, and places of cold temperature adjacent to the Cordilleras of the Andes, or, as we may call them, the Alps of Peru, where the cold prevails throughout the year, especially by night, though the snow never settles or congeals on them. This species generally grows in the clefts and sides of the rocks, or upon them if they are covered with a thin stratum of earth, in quarries, and gravelly, sandy, or clayey places, in which occur a very few diminutive plants of other genera; and where the showers, though generally frequent, do not collect, on account of the declivity and the rocky nature of the ground. It grows spontaneously and very abundantly in many parts of the provinces of Huarocheri, Caxatambo, Tarma, Canta, Xauxa, Huancavelica, Huamanga, Cuzco, Huanuco, Huamalies, Huaylas, Caxamarca, Caxamarquilla, and many others situated among the Cordilleras and mountains of the Andes, belonging to the kingdom of Peru, as well as those of Buenos Ayres and Santa Fe. The root of this Calaguala is gathered, though in very small quantities, in several of these provinces, from whence it is taken down to the ports of Huayaquil, Payta, and Callao, and thence exported to Cadiz.

The second species of Calaguala, known in Peru, as we have already observed, by the name of *Puntu-puntu*, and in some provinces by that of Lengua de Ciervo (*Deer's tongue*), grows near

the base of the Andes in sheltered situations, and in stony and rocky grounds generally covered with rich soil produced from the decomposition of the leaves and other remains of larger or smaller plants, and especially of mosses, the family of which is abundant in those situations. They delight in airy and sunny places; indeed the *Puntu-puntu* is generally found in grounds that have been cleared of trees, where the sun shines freely during most of the day, and where the cold is scarcely felt, except at night. This species abounds in the provinces of Xauxa, Tarma, Huanuco, Panatahuas, Huamalies, Huaylas, Caxamarquilla, Caxamarca, and other provinces contiguous to the frontiers of the Andes, in many of which, quantities are gathered in full growth, and sent for sale to the traders at the sea-ports, who export them to Spain by way of Cadiz.

The third species of Calaguala, denominated *Huacsaro* by the Panatahuas Indians, is found in greater abundance than the two former, on extensive tracts, and on peaks less elevated than those where the first is found, though cold at night, and covered with pasturage and plants, such as the *Ichus*, a species of Jarava, and other grasses, on which the Vicuñas, Huanácos, and Llamas graze; *Siracas*, a species of *Rubus*; *Chinchanchos*, a species of *Hypericum*; *Oessa Purga*, a species of *Sisyrinchium*; *Milucassa*, a species of *Mespilus*; *Pucssato* and *Sumacmisqui*, a species of *Thibaudia*, a new genus of the *Ericæ*; *Sogonches*, species of *Gardoquia*, &c. The ground is generally stony, covered with a stratum of earth more or less thick. The *Huacsaro* likes the air and sun; and wherever it grows, the spot is uniformly exposed to the morning and evening sun, or during the day when the weather is unclouded.

There are such tracts of the *Huacsaro*, that from one of them may be gathered from 75 to 150 pounds of roots. Though

it is very abundant, and grows spontaneously in the provinces of Tarma, Xauxa, Huánuco, Huamalies, and in that of the Panatahuas, I have never heard that the natives collect its roots for trade or other purposes, nor indeed those of another species of the same genus, which grows abundantly among the Huacsaro; and collected in other parts, and mixed with it.

In the Custom-house of Lima I have seen portions of the roots of Huacsaro, and of the other species which are brought by way of Payta and Huayaquil, as well as the capital of Peru, and shipped at Callao for Cadiz; whence it follows that these roots are collected in the provinces of Caxamarca, Huamachuco, Patás, and Chachapoyas, belonging to the Bishopric of Truxillo, and in other places bordering on Huayaquil.

The common method of collecting the roots of the Calagualas is to dig up the plants with a spade, and strip them of the leaves, stalks, shoots, and fibrous parts, leaving only the trunk of the root, which is exposed to the sun, that it may be dried and cleared of the adherent earth: many persons, however, wash the roots before they strip the shoots and fibres; a readier and safer operation for wholly clearing them from the soil, and enabling them to dry sooner, as the fibres are more easily removed when the roots have been washed and half dry, than when they are green and covered with soil.

The drying of all the Calagualas is effected by exposing them to the sun immediately after they have been pulled up and washed; for, on being left some days in the shade, they grow mouldy and lose their due colour and consistency, which they retain when quickly dried in the sun, or, in case of necessity, in stoves or heated ovens, care being taken to turn and move them occasionally, that the moisture exhaling from them may

more readily evaporate. The roots of the Puntu-puntu require more than a month's drying in the sun and open air, and the genuine Calaguala some few days less, though its roots are four or five times slenderer than those of the former; but the roots of the Huacsaro, though rather thick, become perfectly dry in three or four days. This remarkable difference proceeds from the slight humidity and viscosity of the Huacsaro, and from the quantity of viscous and very tenacious juice contained in the roots of the Calaguala and the Puntu-puntu, which, when fresh, are extremely tender; while those of the Huacsaro are woody, dry, and hard, scarcely a degree less than when they have been perfectly dried; so that their bulk sustains scarcely any perceptible diminution in drying, while that of the former is reduced one-third. The desiccation of both kinds may be pronounced complete, when they resist cutting or breaking, appear as hard as a stick, and are not to be bent or penetrated by the nails or teeth; but the roots of the Calaguala are easily masticated.

When the collectors find the roots of the Calaguala sufficiently dry, they pack them in leather bags, and without any other care take them to the sea-ports, whence they are forwarded by the traders to Europe, without examining whether they are perfectly dry; which is very seldom the case with those of the Calaguala and the Puntu-puntu, for the reasons already explained.

From negligent or bad preservation proceeds the almost total corruption of the greater part of the Calagualas which we obtain in Spain; and perhaps this may be one of the principal causes why its effects are not equal to those produced in Peru by the genuine Calaguala when used fresh. The deterioration of the roots, though well dried, may also in a great measure arise from the bad practice of packing them in leather bags, which are



which are wet, and of transporting them by sea and land without any other protection. Another cause of destruction of the Calagualas is, that the carriers of Peru, though it may rain on their journeys, do not protect the packages of roots from showers: consequently the leather coverings get wet, and the roots, by absorbing the moisture, become more or less injured. These men, ignorant in such matters, deliver the packages to the dealers without mentioning the accidents on the road; and the latter confidently store them in rooms having little or no ventilation, or in damp cellars, until they have an opportunity of shipping them; in which case they only receive a change of place, as the supercargoes of the vessels stow them in the hold, or in confined or damp places, where the ambient humidity and heat increase the destruction of the roots.

Finally, on reaching Cadiz or any other port, these packages are stored in close cellars or warehouses frequently damp, where they are totally destroyed, so that the Calagualas now become a noxious drug instead of a beneficial medicine.

What I have here stated is an absolute fact, which may be ascertained by any one in Cadiz; for, on opening a package of Calaguala, a fœtid and corrupt odour will exhale, some of the roots will be found mouldy, and others soft and flexible, when they ought to be hard and brittle as a dry stick and free from offensive smell.

The degree of care used in collecting, drying, packing, and exporting roots, barks, fruits, and other vegetable substances, seems almost uniform in all countries, as experience has shown that the drugs which we receive from all parts of the world, are more or less injured. The Government ought to take cognizance of these affairs, and not suffer medicinal articles to be shipped unless in good condition and well packed, nor admit them unless



possessing all the requisites necessary for preventing so serious an injury to mankind, though apparently of slight importance, from the little regard we pay to our health unless when we are sick, and then we are anxious for medical aid, and for the *best* medicine. Dealers and traders in drugs ought to be skilled in distinguishing the good or bad state of what they buy and sell; but the misfortune is, that this trade, which by an order of Government should be carried on solely by apothecaries and druggists, properly qualified and experienced, is in the hands of empirics, who attend only to their own interests; hence the profit derived from the sale of drugs is the main consideration, and not their good or bad quality.

The conveyance of the roots of the Calaguala should be effected after the mode prescribed in my *Quinologia*, in treating of the package of the barks of the *Cascarillas* or Quinas, in chests with the seams or joinings well secured, and covered with dry hide, to prevent all the damages already mentioned.

The roots of the genuine Calaguala, used as such in Peru, scarcely ever occur in European commerce, as those most commonly sold by the druggists and dealers in Cadiz are of the second, or more commonly of the third, species; that is, of the Puntu-puntu and Huacsaro; and even among those of the second, there are usually roots of other species of *Polypodium*, which from their great resemblance to each other are scarcely distinguishable, except by their thickness.

The roots of the genuine Calaguala differ remarkably from those of the second species, or Puntu-puntu, and both differ wholly from the third, which is a species of a genus distinct from the other two; and the roots of the Huacsaro, also, are usually mixed with those of two other species of its own genus. Besides these species of Calaguala sold by our druggists, other roots of

very different species are met with, either singly or mixed with each other, and among them two or three as slender as the genuine, from which they are easily distinguishable by their insipid taste.

Probably from these mixtures, and from the very scanty supply of the genuine Calaguala in Spain, has resulted its discredit with almost all the Faculty; many of whom have made experiments with it, hoping to produce the same effects and virtues which are daily observed in Peru: but as they have proceeded without considering or being aware of the mixtures, and without due knowledge and discrimination of the genuine Calaguala, they have unjustly taken up their pens to decry it; and perhaps for the same reasons the Calaguala is excluded from the *materia medica* of Linnæus and from that of Bergius. It always happens that effects follow causes: the Calagualas at present in general use are, as already explained, species very different and distinct from the genuine Calaguala employed in Peru; hence it is not surprising that their effects are widely different.

Various dissertations have been lately written in Italy for and against the Calaguala.\* This difference cannot have otherwise arisen than from their experiments being made on roots of distinct species. From scarcely any of the apothecaries, and from none of the druggists of Madrid, have I been able to obtain a single root of the genuine Calaguala, which is generally unknown to the Faculty; and thus, if any one had recourse to the Calagualas sold in Madrid as a remedy in disorders, or

\* Dr. Gelmetti, a learned physician of Mantua, after various new experiments which he has made and published, recommends the use of the Calaguala for various disorders. Dr. Bassiano Carminati published at Pavia, in 1791, a tract against the Calaguala, entitled, "*Some Researches on the Principles and Virtue of the Root of Calaguala,*"

for chemical observations and experiments, the failure in the results is to be attributed to no other cause than this.

Most of the Calagualas now sold by the druggists of Madrid, who are supplied from Cadiz, have no perceptible bitter or other taste or smell indicating any virtue; they are actually almost tasteless; and if a root of some kind be casually found of a bitter taste, it is so slight as not to merit the least attention, considering the peculiar bitterness of the genuine Calagnala.

From what I have here stated, it is not to be inferred that I aim at excluding from medicine all the roots sold to us for Calagualas, or to maintain that among them there is not any which possesses medicinal virtues; for it is to be presumed that these do exist in a species which has come into my possession, similar in figure to the great oruga of the Elm and Ash, and whose roots are from two to three inches long and one inch thick, curved, with small protuberances on the lower parts, and covered on the upper with the bases of the shoots, disposed in three or four alternate orders, and of considerable bitterness, but less intense than that of the genuine.

My sole object in this Memoir is to remove the doubts and ambiguities which exist on this matter; to illustrate, by means of the subjoined descriptions, an exact definition of the genuine Calagnala, and the difference existing between it and the other two species; and, lastly, to shew that the opinions, experiments, and observations on the virtues of the Calagnala, have not been well founded, and that most of the investigations have proceeded, according to a common expression, blindly, and prejudiced by statements of little or no certainty.

## ARTICLE III.

*Of the virtues and uses of the genuine Calaguala ; of the other two Species admitted as such in commerce ; and of the only criterion for remedying the Mixture of other roots with the genuine.*

There are few persons who have not some knowledge of the deobstruent virtue of the Calaguala, since in Spain it is generally observable, that when any person receives a blow or a fall, he has recourse to it immediately. The Faculty, though many of them doubt its virtue, and some of them pronounce it to be vain and imaginary, generally prescribe, either before or after bleeding, in case of a blow or a fall, no other medicine than the tincture or decoction of the Calaguala. The Indians and other natives of Peru are convinced that it possesses really great deobstruent, sudorific, anti-venereal, and febrifuge virtues, and to call them in question would be unjust, since they have been proved by the experience of so many years.

Many are persuaded that the family of the *Filices* have few or no virtues, and some have even a more unfavourable opinion, founded on the circumstance of their growing in shady and ill-ventilated spots ; but these persons may be reminded of the anthelmintic and emmenagogical virtue of the root of the Fern, *Polypodium Filix mas* Linn., the emollient and pectoral virtue of the *Polypodium vulgare* Linn., the astringent virtue of the Spleenwort, *Asplenium Ceterach* Linn., and the aperient virtue of the Maiden-hair, *Adiantum Capillus veneris* : these, besides growing, like the Calaguala, in airy, pure, and salubrious situa-

tions, ought to be excepted from the general rule ; and for the same reason their principles must be more analogous to our nature, and of course favourable in their properties and effects, as observation and experience prove.

The genuine Calaguala is universally used in Peru to thin the blood, to promote perspiration, and to mitigate rheumatic and venereal pains. It is frequently used in falls, blows, contusions, and in bodily strains caused by over-exertion, and its efficacy is acknowledged in dispersing internal imposthumes.

I confine myself to these general notices, which I originally collected in Peru, as serving to instruct and enlighten those persons in Europe who frequently attribute very different virtues to the Calaguala ; which, in my opinion, do not all merit belief, until they have been proved by experiments and researches made with sound judgement.\*

The most common method of using this root in Peru is in

\* The *Pharmacopœia Matritensis*, printed in 1762, states, that the Calaguala is chiefly used in decoction, though sometimes administered in powder, and that its virtue is aperient, solvent, and sudorific. Don Diego Bravo, already mentioned, affirms in his Dissertation, that this root is one of the most powerful antisyphilitic medicines, when administered in the form of a pisan ; that it is the best deobstruent in medicine, the best specific hitherto met with for the total extirpation of internal and external imposthumes ; that it also readily dissipates or dissolves the accumulations of extravasated blood (especially in falls) ; that it is an excellent hæmoptico and wonderful emmenagogue, of great effect in jaundice, in affections of the chest, and that it radically removes tertian and quartan agues ; that the powder of the Calaguala abates coughing, relieves oppression of the chest, and hoarseness ; lastly, that it is diuretic, &c. That it is to be administered in every species of gonorrhœa to heal and cleanse the internal ulcers ; that it is given to promote menstruation, facilitate lochia, to solve scirrhus dispositions and grumous concretions of the blood ; that it is solvent and expellent ; that it assuages the tormenting pains which ensue after delivery, called by the vulgar after-pains ; that in the latter cases the women drink the decoction sweetened with honey ; that it is used with great advantage in removing pleuritic inflammation, and to facilitate expectoration : in suppurations of the viscera it is taken with great benefit, mixing two ounces of honey and two.

decoction or infusion, allowing to every six pints of water one ounce of fresh roots bruised; they boil it on a slow fire in a glazed pot, covered, until the liquid is diminished one half, and without straining, they take out, after it has settled, the quantity to be used each time, either hot or cold, as may be most suitable to the patient. In the morning fasting they are accustomed to take the decoction warm, sweetened with a little sugar; but in the course of the day they drink it *ad libitum*, cold and not sweetened, in syphilis, or for bruises, contusions, and falls, to prevent the probable results of such accidents; as the Faculty say that this specific operates as a powerful deobstruent, solvent, balsamic, and diuretic remedy. The natives of Peru, and even the Faculty themselves, affirm, that much sediment is observed in the urine of persons who have used the decoction of the Calaguala. To employ it green as well as dry, it is not necessary to boil it as is commonly done; it is sufficient only to bruise and infuse it in cold water for a few hours, as it readily yields its bitter and saline extract, especially if care be taken to shake the bottle or vessel in which the infusion is made. The

of butter with three pints of the decoction; and in other cases, equal parts are taken of the decoction and asses' milk, or, in defect of that, cows' milk, with great benefit to patients. The Professor adds the various preparations used of the Calaguala; the regimen and method of administering; the results obtained on the analysis which he made of it; the dose; and lastly the experiments and observations, made with great success on different subjects, with the Calaguala, communicated by Don Juan Felix de Andrade, and dispensed by the method of Dr. Peralta, who, according to Bravo, was the first Spaniard who promulgated at Court the admirable virtues of the genuine Calaguala, which was probably that obtained by Bravo and Andrade from Bartholomew de Andrade, who stated to Professor Bravo that he had collected it with his own hands in the hills of Cuzco, as of a superior quality to that of Quito and the other provinces of Peru. In the Appendix to his Dissertation he inserts the operation for separating the essential salt, as he calls it, of the Calaguala, having used the hydraulic machine constructed by Count de la Garaye; and he affirms that the use of this salt, or rather saline extract, produces better and stronger effects than the pisan and other modes of administering the Calaguala.

case is otherwise with the other two Calagualas, since, after being well bruised, they require a long digestion to enable the water to extract from them the little viscous and other principles of which they consist, being naturally ligneous and very hard when dry: the roots of the Huacsaro are so, even when newly taken from the earth.

The effects of the Calaguala, when used fresh, are perceived to be more prompt and efficacious than when dry; but, when used in the latter state, it does not lose its virtue, as experience has shown in Peru. Every experienced physician well knows, that many dried vegetables, collected and preserved with care and attention, produce equal effects as when used fresh, but operating less quickly. There are many plants which, after drying, provided due skill and care have been used in preserving them, impart to water or other liquids all their principles with greater facility than when they are fresh, and consequently produce better effects. I have no doubt that the root of the Calaguala, administered in powder as is the practice with some, will be equally effectual as when taken in infusion or decoction; yet I shall prefer using the infusion or saline extract, well elaborated, so long as the experience and observations of eminent professional men do not decide otherwise.

From the account I have just given, it must be inferred that the virtues of the genuine Calaguala are not so imaginary as some physicians have supposed, who, influenced by groundless reasonings and statements, have judged so unfavourably of a medicine, which for a series of years, in Peru, has been proved to produce the results already stated; wherefore, in my opinion, a too credulous physician is equally to blame with the incredulous; since the former ought to require more than a superficial knowledge of the virtue of a simple or compound, in order not



to err in using it; nor is it proper in the latter to depreciate such knowledge without previously ascertaining the truth or discovering the fallacy, by means of experiments and observations, undertaken with a clear and distinct knowledge of the medicine itself, of the state in which it is found, and of its constituent principles; because, without these premises, reason may convince us how uncertain all the experiments must be which we may try for ascertaining the virtues and uses of any substance whatever.

In order to remedy the mixtures made of other roots with those of the genuine Calaguala, it appears to me that the only obvious and practicable method for the present, is, that the traders and merchants of Cadiz, as well as other individuals or companies, should charge their correspondents in Peru, to take care that in those regions the very roots of the Calaguala should be collected which are sold fresh in the Square of Lima, and that there be left to each root, or to most of them, a leaf, which may serve as a criterion for the identity of the species, until such time as our merchants, druggists, and professional men, have acquired such skill in distinguishing it, as not to require an indication which is at present so important and necessary.

## ARTICLE IV.

*Of the difference between the Genuine Calaguala and the other Roots with which it is confounded, and of the Reasons that exist for adopting the vulgar Names of Calaguala and Huacsaro.*

The *Polypodium Calaguala* is a very different species from any of the *Polypodia* mentioned by Linnæus in his *Species Plantarum*. It approaches nearest to the *Polypodium lanceolatum* of that author, or to the *Phyllitis, folio longo, angustifolia, masculis majoribus* of Petiver *Filic.* 8. tab. 6. fig. 2. differs from the latter in this respect, that the spots of fructification do not pass beyond the middle of the frond, and are disposed in two lines in a quincunx order; that is, some of the spots are alternately contiguous to the principal nerve of the frond, the rest of the spots are a little distant from it; so that they form two lines, one resting on the nerve, the other somewhat remote. The spots of fructification in *P. lanceolatum*, on the contrary, are placed in two parallel lines along the whole of the frond; that is, on each side of the nerve there is only one line of sori, as is illustrated in the figure of Petiver. *Calaguala* likewise differs in the margins of the fronds being revolute, and the stipes being covered with small squamæ, which marks are wanting in *P. lanceolatum*. Though in some narrow frond of the *Calaguala* only one line of sori is observable on each side of the midrib, and also in the broadest fronds, which proceed from the same root with the narrow and middle-sized, some of the sori are seen to deviate towards the margin of the frond out of the regular line, they never occupy the whole length of the frond, as in *P. lan-*

*ecolatum*, but in general only the half of the frond; and if they should exceed that, the additional space is so short as to be unworthy of notice, and at least one-third of the frond in the lower part is destitute of sori.

The *Polypodium Phyllitidis* of Linn., considered by some as the genuine *Calaguala*, differs from it in having narrower and proportionably shorter fronds. They also abound in transverse nerves, which are wanting in those of the *Calaguala*, in which their place is supplied by branching veins which are not readily distinguishable, and are quite different from the short lateral nerves commonly met with in other species of *Polypodium* with simple fronds. The sori of *Polypodium Phyllitidis* are scattered over the whole under surface of the frond, as Linnæus observes in his *Species Plant.* 1543, and as they are represented in the figure of Petiver, *Filic.* 5. p. 6. f. 10, and by Quer in *Flora Espan.* tom. 6. p. 124. fig. 12.

The *Puntu-puntu*, which is the second species of *Calaguala* brought to us from Peru, and which most resembles the *P. Americanum* of Quer, differs from the latter in the greater size and thickness of its fronds, and in its form not being so perfectly lanceolate. The spots of the fructification are successive, that is, between the transverse nerves there is no more than one series of sori, whereas in *P. Americanum* there are two consistent series; and finally the fructifications do not occupy the whole under surface of the fronds, as in those of the latter according to the plate of Quer, who reduced this species to the *P. Phyllitidis* of Linn.; and my *Puntu-puntu* corresponds exactly with the definition given by this author of *Polypodium crassifolium*, and with the figure of the *Phyllitidis maculata*, amplissimo folio of Petiver, *Fil.* 1. p. 6. f. 8. The third species of root which is brought from Peru under the name of *Calaguala*, is a new species of

*Acrostichum*, belonging to the division of Linnæus, with simple fronds, which differs entirely from the Calaguala, the Puntupunta, and all the other roots which are not species of the same genus. All others who have treated of the Calaguala have differed in the description which they have given of it; a proof that they have spoken solely from information regarding the genuine Calaguala, and this information is very doubtful, or applicable to various species of *Polypodium*.

Although the Indian words *Cchallahuala*, or *Calaguala*, as it is now written, and *Huacsaro*, are familiar only to a few persons, and those Americans, I have thought proper to adopt the first as the trivial name of the *Polypodium*, and the second as that of the *Acrostichum*; naming the former species *Polypodium Calaguala*, and the latter, *Acrostichum Huacsaro*, it appearing that these Indian words originate from concurrent indications in the plants themselves, as I have before shown.

## ARTICLE V.

*Description of the Polypodium Calaguala, which ought to be used in medicine.*

### CLASS XXIV.

#### *Filices.*—*Polypodium Calaguala*.

P. frondibus lanceolatis integerrimis: marginibus revolutis, fructificationibus a medio ad apicem in quincuncem dispositis, solitariis, parallelis. *Flor. Per. edend. cum Icon.\**

\* As the Calaguala is not to be published in the Flora of Peru and Chili, according to the order observed in the publications; and as the plate will not be given before the last volume of

*P. (Calaguala)*.—Leaves lanceolate, very entire, margins revolute; spots of fructification disposed in a quincunx, solitary and parallel.

*Root*.—Round, somewhat compressed, slender, horizontal, creeping and flexuose, covered on the under surface with long, branching, dark-grey fibres, and on the upper surface with fronds disposed in two rows alternating with each other; of an ash colour on the exterior side, and covered almost throughout with spreading scales, and on the interior of a bright green colour, furnished with many small nerves, which extend throughout its centre. After slow desiccation it becomes on its exterior surface of a dark ash colour, after the scales or scurf have been removed, and when cut it exhibits in the interior a compact substance, in some degree resembling that of the sugar-cane or citron, and of a pale straw colour more or less intense. The taste is at first sweet, followed by a strong disagreeable bitter, somewhat viscid. It may readily be masticated without any resistance; at the time of mastication, when cleared, it exhales a kind of rancid oily odour.

*Fronds*.—Disposed alternately in two series, varying in length from half a foot to a foot high, and from three to seven lines wide in the middle; stiff, lanceolate, somewhat curved, very entire, naked, firm, and very juicy; without transversal nerves, having instead of them indistinct branchy veins, shining, margins revolute, covered on the anterior surface with whitish dots, and on the posterior side with fructification from the middle to the apex in those fronds which have attained their full size; from the middle downwards is destitute of them. In the young

the above work, the present anticipation of the Plate in this Memoir, has been permitted by the Minister of the Indies, in order that Naturalists as well as the Professors of the three branches of medicine, might be made distinctly acquainted with the Plate.

and half-grown fronds fructification never occurs. Stipes naked, rather shorter than the frond, plain on the anterior surface, and furrowed towards the base, the ridge of the posterior side extending to the termination of the frond along its midrib.

*Fructification*.—Disposed in little round spots, from the middle of the frond to its apex, in two lines in quincunx order, or alternately deviating from the line towards the margin. The spots before the capsules can be readily distinguished with a microscope, are of a brown chesnut colour, smaller by half than when the spots have attained their full growth, in which state they are of a red chesnut colour, and sometimes tawny, about the size of half a lentil: each spot consists of more than seventy capsules, attached to a receptaculum covered with very short hairs.

*Capsules*.—very short; pedicels orbicular, convex on both sides, and somewhat compressed, about the size of half a grain of mustard, thin, paper-like, whitish; surrounded almost wholly by an annular membrane, which bursts elastically, near the insertion of the piece, into two valves, appearing like the skin of a grub or maggot.

*Seeds*.—numerous, very minute, oval, shining, whitish with a tinge of yellow, attached internally to the annular membrane, from which they spring elastically on the bursting of the valves.

*OBSERVATION*.—For want of a good microscope, I was prevented from deciding on the fructification of both sexes, which I suspect occurs in the genus *Polypodium*, as well as in *Acrostichum*; because, with a common lens, two different bodies are distinguishable, in some of which capsules are observable, in others they remain as if blasted, and scarcely perceptible.

It grows abundantly in the hollows of the Punas, and on the cold mountainous regions of the provinces of Canta, Huaro-

cheri, Caxatambo, Tarma, Xauxá, Huancavelica, Huamanga, Cuzco, Huanuco, Huamalies, Caxamarca, and other parts of the kingdom of Peru, and in the neighbourhood of the lakes of Lauricocha, Yanricocha, and Chinchaycocha, all situated in the province of Tarma; the first scarcely ten leagues distant from the second, and the third only four leagues. Yet the waters which flow from them, and give rise to the three celebrated rivers, Marañon, Huallaga, and Ucayali, run in a winding direction for an immense distance, and after a course round our extensive mountains and those of the natives, the second, which is navigable for boats and canoes from the strand of the town of Cuchero, distant ninety-five leagues from Lima, unites with the first in the countries of the Chamicuros and Marinas Indians, and the third with them in those of the Omaguas Indians.

It is found throughout the year with fructifications or protuberances, which in all their states are without integuments.

The Indians give it the name of *Ceallahuala*, and the Spaniards that of *fine Calaguata*.

#### OBSERVATIONS.

Having taken a scruple of this root well bruised, I infused it in three ounces of distilled water, which in a short time was tinged of a clear red colour; in two hours it became of a clear chesnut; but though I kept it two hours longer in cold infusion, and shook the vessel from time to time, I perceived no farther change in the tint. The flavour of the infusion proved sufficiently bitter. The oily rancid odour perceptible after bruising the root of the Calaguata, was entirely dissipated, and only a slight scent proceeded from the infusion. When treated with sulphate of iron, the chesnut colour changed to a greenish blue, an indication that the root contains an as-



tringent principle. The tincture of galls poured on the infusion did not alter it in the slightest degree. The substances soluble in water being extracted, I proceeded to examine whether it contained any resinous principle; for which purpose, after having dried the residuum, I infused it in an ounce of rectified spirit of wine. After an infusion of forty-eight hours, it acquired no tincture whatever; nor, when poured into water, did it give any indication of resin; no froth arose, as is the case with saponaceous substances; on the contrary, the foam immediately subsided, which I produced by repeatedly shaking with violence the infusion in the distilled water.

---

#### EXPLANATION OF THE PLATE.

1. Sorus of fructification magnified.
2. A capsule very highly magnified, closed with its annular appendage.
3. A very highly magnified capsule just opening, with its very short pedicel.
4. A capsule entirely open.
5. Seeds.
6. Seed magnified.
7. Receptacle magnified.



POLYPODIUM *calaguala*.

W. H. H. H.





DESCRIPTION  
OF THE  
**THICK CALAGUALA, OR PUNTU-PUNTU.**

---

**POLYPODIUM CRASSIFOLIUM.**

*P. frondibus lanceolatis integerrimis subundulatis, fructificationibus serialibus a medio ferè ad apicem.* Flór. Peruv. edend. cum Icon.

*P. (crassifolium) frondibus lanceolatis glabris integerrimis, fructificationibus serialibus.* Linn. Sp. Plant. 1543.

*Phyllitis maculata, amplissimo folio.* Petiv. Fil. p. 6. fig. 8.

*Polypodium* (thick-leaved)—Fronds lanceolate, very entire, slightly undulated; fructifications disposed in transversal lines from the middle to the apex of the frond.

**Root**—Round, somewhat compressed, long and thick, horizontal, fragile, of a pale or bright green colour, covered with membranous scales which commonly fall off at the time of desiccation, covered on the upper surface with fronds, and on the under side with woolly fibres, which separate readily from the principal root after drying.

**Fronds**—Disposed in two series along the whole root, and alternating with each other, from a quarter to more than a vara (yard) in length, and from one to three inches broad, lanceolate,

plain, slightly undulated at the margins, very entire, thick, stiff, fragile, naked, and shining, covered on the upper surface with minute pellucid dots, the under side horizontally nerved, and covered with fructifications from the middle upwards, though in some fronds they descend within two or three inches of the base.

*Stipes*—long, semicylindrical, naked, and shining, channelled on the upper side.

*Fructification*—In round spots, naked, about the size and shape of a lentil, disposed in transversal simple lines, that is, between the transversal nerves.

*Capsules*—Many in each spot, pedicelled, and in all respects similar to those of the preceding species, but smaller, interspersed with hairs and filled with very small oval seeds.

*Grows*—In the mountains and woods of the provinces of Tarma, Panatahuas, and others in warm situations on gravelly and rocky grounds destitute of trees.

It is found in fructification throughout the year. The Indians denominate it *Puntu-puntu*, and some Creoles call it *Deer's tongue*. In commerce and with the apothecaries it is distinguished from the first and the following by the designation of *thick Calaguala*.

*Uses*—The natives of Peru use the decoction of Puntu-puntu as a sudorific in pains of the side.

#### OBSERVATION.

The cold infusion and the decoction of this root, made in glass vessels with distilled water, assume a clear red. The flavour both of the infusion and decoction, and of the root itself when masticated, is somewhat viscous, with a degree of sweetness by no means unpleasant, and without the slightest bitter. The in-

fusion and decoction treated with sulphate of iron manifest a very slight alteration.

#### NOTE.

The roots of the Puntu-puntu, after being slowly dried, are reduced to a fourth part of their thickness when fresh, wrinkled, or furrowed, forming tortuosities or undulations which they had not before, somewhat compact, heavy, and equal on cutting, having on the lower part very small protuberances proceeding from the fibres, and on the superior covered with the bases or insertions of the stalks, which are disposed in two ranges, and nearly of a circular figure: externally they are of a rusty and rather chesnut colour, and internally of a clear red, with some whitish little nerves which cross them longitudinally; they have no perceptible odour, and the flavour is somewhat sweet and glutinous. The root, on being masticated for some time, grows spongy, and causes, when chewed, a certain harsh sound between the teeth. Choice should be made of the most compact, heavy, difficult to cut, and of even fracture, red within, and rusty or chesnut coloured without. Little value is to be placed on that which is light in weight, spongy, blackish, decayed, or worm-eaten, and which cuts easily or unequally.

DESCRIPTION  
OF THE  
**CALAGUALA MEDIANA;**  
(THE CORDONCILLO, OR THE LITTLE CORD.)

---

**ACROSTICHUM HUACSARO.**

*A. frondibus lanceolato-linearibus integerrimis, fructiferis angustioribus prominulis.* Flor. Peruv. edend. cum Icon.

*Plant*—Cæspitose.

*Root*—Horizontal, creeping, branched, about two feet long, of the thickness of a finger, furnished with numerous slender fibres; surrounded by the stipes, which mutually fold over each other, so as to form a cord or braid, of a dark grey colour without, and a dark tawny within.

*Fronds*—Numerous on the whole circumference of the root, and erect by means of the upward curvature of the stipes disposed in two rows, linear-lanceolate, very entire, slightly undulated on the margins, scarcely juicy, rigid, smooth and shining, and with the mid-rib carinated on both sides of the frond, sharper on the posterior side. Sterile fronds flat, more than half a yard (vara) long, fertile ones narrower, almost double the length, at first revolute and carinated, afterwards straight and flat,



*Stipes*—somewhat long, folding over each other at the base, stiff, giving the root the appearance of a cord or braid, semi-cylindrical, flat on the anterior side, with a slight furrow, and when young covered with scurf or small loose scales.

*Fructifications*—very numerous, covering the whole back part of the fertile fronds; of a ferrugineous and sometimes blackish colour, interspersed with hairs.

*Capsules*—pedicelled, orbicular, furnished with a ring, and filled with many minute shining seeds.

*Grows* abundantly on elevated hills where the temperature is cold during the year, in the neighbourhood of Pillao, Panao, Acomayo, and Chaclla, towns of the province of the Panatahuas, and in various other provinces bordering on the Andes, as those of Xauxas, Tarma, Huamalies, Caxamarquilla, Caxamarca, &c.

It is found with fructification throughout the year. In the province of the Panatahuas this plant is known by the name of Huacsaro. In other provinces where its roots are an article of commerce, it is called *Calaguala mediana*.

#### OBSERVATION.

The cold infusion and decoction of these roots made in glass vessels with distilled water, assumes a red colour without any perceptible odour, except an earthy scent, and of a rather astringent taste indicating the presence of gallic acid, as was proved by the alteration resulting in both liquors with sulphate of iron, forming a black but not very high tint.

#### NOTE.

The roots of the *Huacsaro* as they occur in commerce, divested of fibres and with remains of the stalks of the leaves, present the figure of braided cords of many plaits, more or

less perfect, twice as thick as a common quill, and of rather compact consistence, but far from heavy, and hard to cut, either when dry or newly pulled from the earth, being naturally dry and of no manifest viscosity; on the exterior they are of a dark grey with some thin blackish scales, and within of a dark tawny approaching to red; when cut horizontally they exhibit six or more whitish points between the centre and the circumference, which correspond to as many little nerves which traverse it lengthwise. No odour is perceptible in them except an earthy and musty scent, very feeble, and the taste somewhat harsh and astringent, though not at all unpleasant.

---

**MEMOIR**  
ON THE  
**VIRTUES AND USES OF THE ROOT**  
OF  
**THE PLANT CALLED YALLHOY,**  
**IN PERU.**

---

**BY DON HIPPOLITO RUIZ,**  
 FIRST BOTANIST TO HIS MAJESTY IN THE EXPEDITION TO PERU,  
&c. &c. &c.

---

**PRELIMINARY NOTICE.**

**T**HE inaptitude of the remedies commonly applied to the cure of dysenteries, and the powerful antidote discovered in the root of the plant called *Yallhoj* for these severe disorders, encouraged me to write the present Memoir, with the object of publishing it for the general good. For the fulfilment of my wish, I presented it to the Royal Medical Academy of Madrid, in order that this learned body might examine it with their wonted critical attention, and, if it incited their approbation, might insert it in the second volume of their Transactions. The Academy, after ordering some experiments to be made, approved it, and permitted it to be incorporated in that volume, with other Memoirs intended

for the press ; but the publication of the second volume being unavoidably retarded, and the Royal Academy desiring that this Memoir should appear as soon as possible, favoured me with the necessary certificate for publishing it on my own account, as I now do, for the general benefit.

---

ANY discovery in the vegetable kingdom, of qualities capable of supplying the first necessities, or curing the disorders incident to human nature, is certainly of greater value than a hundred discoveries of no known utility.

One of the first and most estimable is the plant called in Peru *Yallhoy*,\* and known in other parts of that kingdom by the name of *Masca*,† the bark of whose roots presents many medicinal and economic virtues.

The abundant foam, similar to that of soap, which is yielded by the fresh and dry barks of the *Yallhoy* when pounded and infused in hot or cold water, and shaken slightly or for a long time, shews that there exists in these barks a great proportion of saponaceous matter.

This indication is in some degree proved by the circumstance of these barks being used as a substitute for soap in washing and cleansing linen of all kinds. For this purpose the fresh bark of the roots of the *Yallhoy*, is well pounded and moulded into balls, which are sold in the shops and great Square of Huano; and the dry barks are also sold in the markets for the same purpose.

\* Signifying to cleanse filth or impurities.

† Equivalent to tassel; thus *mascapaycha* means the regal tassel of the Incas.

The natives of the province of Huanuco, and the Indians of the mountains of the Peruvian Andes, make use of these barks for washing the head and for cleansing it from dirt and scurf, from a persuasion (particularly among the fair sex) that with this lotion the hair is nourished, and acquires greater softness, flexibility, and lustre. This fact is well founded in theory; and experience has fully demonstrated it by the long and beautiful hair generally observable in those persons who make frequent use of such lotions.

For the same purpose of cleansing the hair, the inhabitants of the province of Tarma, as long ago as the year 1797, used the barks of the root of another species of the genus *Monnina*, denominated in that country *Pahuata-huinac* and *Chissip-huinac*, that is, *Growing by night*, and also *Hacchiquis*; all which is intimated in the first volume of our *Systema Vegetabilium Floræ Peruvianæ et Chilensis*, page 172, at the end of the specific definition of the *Monnina salicifolia*.

In the city of Huanuco the barks of the Yallhoy are frequently used for cleansing and polishing wrought silver; and the silversmiths hold it in great estimation for that purpose.

From the different sensations excited on the palate and tongue, on chewing the barks of the Yallhoy, from their sharp, acrid, acid, bitter, mucilaginous, saponaceous, and somewhat nauseous taste, it is to be inferred that they contain many specific virtues.

To be able to ascertain them, it is necessary to avail ourselves of those excellent rules prescribed for us by the reformer of botany in the immortal philosophy of this science, and, after well considering them, to proceed to a pharmaceutico-chemical analysis of its parts, in order to deduce from the most obvious principles manifested by that analysis, the qualities and properties of the plant, availing ourselves also of the analogy which it possesses with other vegetables whose properties are known.

It sometimes occurs, that in the urgent necessity for alleviating pain, man is obliged to use whatever remedy he imagines efficacious; and without reflecting on the ill consequences that may ensue, he affords to the scientific observer considerable light for pursuing his investigations with greater certainty and promptitude.

Such has been the case with the first trials of this new remedy of the Yallhoy; because the Faculty in Huanuco, finding that none of the remedies in medical use were adequate to arrest the fatal progress of an epidemical dysentery which prevailed in that city in the years 1788 and 1789, prescribed clysters of the decoction of barks of the root of the Yallhoy. They were induced to do this by observing that the natives already used the bark with success for evacuating the intestines when affected with irritating diarrhœas. Observing the good effects resulting from these clysters, the Faculty made a further step, and administered internally the infusion of a small quantity of the barks made in hot water.

By these aids a considerable amelioration was observed to take place among the sick in a few days; and by frequent use the Physicians succeeded in radically curing the epidemic, to their own great satisfaction, and to the admiration of all persons.

Since that period the Physicians in Peru have preferred the bark of the root Yallhoy to that of the *Simarouba* or *Quassia* of Linnæus, as a cure for dysenteries; and some of them, reasoning solely from the effects produced by these barks, give them the improper name of *Simarouba Peruviana*, which ought not to be adopted in medical use; because, though they agree in their effects, yet being plants of distinct classes both naturally and artificially, the common term would in time occasion much doubt and confusion in *materia medica*; wherefore the terms *Monnina polystachya* and *Yallhoy* should always be employed to designate the genuine anti-dysenteric plant of Peru.

It being the province of a botanist to establish permanently the exact knowledge and distinction of any vegetable which he may discover, by means of a complete description, and to deduce its properties and virtues from the affinity which the new vegetable may hold in class, order, and genus, with those already known; from the flavour, odour, colour, and habitat; from the most remarkable principles and substances ascertained by pharmaceutico-chemical analysis, and from information obtained from the natives of the country where the plant spontaneously grows; and finally from observations of his own, made with great care and attention; I believe that on my part the obligation of the botanist is in some measure discharged in this short dissertation, with the methodical and historical description which I give of the plant, with a diagnosis of the characters found in the bark of its roots, and with an exposition of those substances and principles, found in it, by means of a chemical analysis performed (as the root is inodorous) in the humid way, as preferable, and less exposed than in the dry way to the disadvantage of having its principles decomposed or destroyed by fire; and of obtaining in the result, substances and combinations distinct from those which nature in her wisdom has deposited in that part of the plant.

From the greater affinity which, in relation to other plants hitherto known, the genus *Monnina* possesses with the genus *Polygala*,\* it must be inferred that the virtues of the Yallhoy coincide with those of the roots of the *Polygala Senega* of Linnaeus, and, like them, may serve as a deobstruent in obstructions of the lungs and other viscera, as a cure for dropsy, asthma, and

\* From the incomplete descriptions that authors have as yet given us, who have treated of the *Polygala Senega*, it cannot be decided with certainty that this plant belongs to the genus *Monnina*. But from the characters exhibited in the plates given of the former by Miller in his *Dictionary*, tom. 3. tab. 5. and by Count Castiglioni in his *History of Foreign Plants*, tom. 3.



other disorders in which use is made of the *Polygala Senega*, which is a plant seldom sold in Spain.

To decide this well-founded conjecture, Physicians should make a diligent and attentive use and application of the bark, in order that medical experience and observation may prove it satisfactorily.

If, as I hope, the bark of the Yallhoy operate in Europe with the same effects which it produces in Peru against dysentery, and if it likewise be found to possess the properties attributed to the *Polygala Senega*, the catalogue of *Materia Medica* will be enriched by the addition of this new and powerful remedy.

With this view I submit to the Royal Medical Academy of Madrid the present Memoir, hoping that its learned members will, with their accustomed zeal, perfect and rectify a work so important to the welfare of humanity, which was begun but not concluded with due critical accuracy in Peru, and which I cannot accomplish satisfactorily myself.

Henceforward there is reason to hope, that as the admirable styptic of the *Ratanhia*,† or *Krameria triandra*, sanctioned by

p. 177. tab. 70. it is very probable that the *Polygala Senega* is a species of *Monnina*\*, as are also, I suspect, various other species which botanists have classed and confounded among the *Polygalas*, as will be stated in the sixth volume of the *Flora Peruviana et Chilensis*, when we treat of both genera in that work.

† Besides the virtues of the extract of *Ratanhia*, mentioned in the dissertation which I published on that specific, it has been latterly observed by some of the Faculty, that it includes a certain tonic virtue which renders it still more estimable and worthy the attention of medical men. It has also been found that a cataplasm of *Ratanhia* operates powerfully on tu-

\* Of this genus M. Bonpland has described sixteen species under the name of *Hebiandra* in *Ag. Natur. Freunde Za Berlin*, 1803, which, with several new ones in the Lambertian Herbarium from Don Jose Pavon, may increase the number of species to twenty-four. A careful examination of the fructification of *Polygala Senega*, proves that it does not belong to *Monnina*, as conjectured by M. Ruiz. It, however, ought to form, perhaps, with some others, a genus distinct from *Polygala*. There are in the Lambertian Herbarium from Pavon twenty-three species of this latter genus, chiefly from Mexico. The genus *Monnina* is never met with in the colder or elevated regions.—EDIT.

the Royal Medical Academy of Madrid spread rapidly through Spain, and through many other parts of Europe, the use of the barks of the Yallhoj will be likewise propagated among all nations.

Every day new productions are announced to us by Naturalists, but we seldom attain the main object, of having their qualities, virtues, and applications made known; and therefore a useful discovery, like that of the root of Yallhoj, in economy and medicine, ought to be more prized than an infinite number of discoveries of no known use.

For this reason it is proper that the use of this new production should be established and propagated as a precious remedy against dysenteries, which are sometimes so afflicting to human nature.

mours, resolving and restoring tone to those debilitated and relaxed parts. And lastly it has been known to correct and cure all kinds of ulcers, when applied to them in light plasters.

It is somewhat difficult to divest some professional men, of the vulgar and false notions that the extracts are a useless medley. Natural reason dictates, and sound chemistry proves to us, that in well elaborated extracts, as much as in good doctrines, the virtue of the vegetable resides; and when plants are inodorous, or have little smell, it is indisputable that the extracts of them contain all or nearly all their virtues, as is proved by the extracts of opium, nettles, aloe, rhubarb, &c. with the additional advantage of being available in a small compass, and in pills, when the stomach of the patient will admit neither decoctions nor infusions hot or cold. The extract of *Ratanhia* operates with greater efficacy, exhibited in all the prescribed modes, than decoctions of the root from which it is extracted. Want of experience in administering the extract of *Ratanhia* has obliged some practitioners to suspend the application of this very powerful medicine, because its styptic virtue and bitterness are generally repugnant to the patient, or because he usually vomits the first doses given to him; wherefore it appears to me worthy of notice in this place, that, although at first there may be some repugnance on the part of the patient, or he may involuntarily eject the first doses, it is necessary to persevere in repeating them, because the result seldom fails to be, as others of the faculty have experienced, that the stomach will retain the fourth and succeeding doses, especially if the patient immediately chew a little lemon, and drink and gargle with vinegar, diluted in two parts of common water; and if the object be not thus attained, let the extract be given in pills with the same corrective, and the desired result will be obtained.

The more valuable a medicine is, the simpler and less complicated is its exhibition. In the bark of the Yallhoy we have this advantage, because, to ensure its good effects, it is not necessary to mix or combine it with other simples or compounds, which might perhaps alter, lessen, or destroy its virtues, as is proved with respect to the Yallhoy, as well as other powerful remedies, especially the styptic of Ratanhia already mentioned, which operates alone with greater efficacy in bloody fluxes, than when mixed with the different astringents which it has been the practice of some Physicians, perhaps unnecessarily, to add to it. Therefore, until this matter shall be further illustrated by experience, I propose for the dispensation of this new remedy the following formulæ:—

*Anti-dysenteric Infusion of Yallhoy.*

Take of the barks of the Yallhoy .. 1 drachm and a half,  
Common water, boiling .. .. 1 pint:

The barks, well bruised, must be infused in a jar or earthen vessel closed up for an hour, to be shaken occasionally. When almost cold, it may be filtered off for two doses.

*Anti-dysenteric Powders of Yallhoy.*

Take of very fine powdered bark of Yallhoy .. 1 scruple,  
Common sugar .. .. 1 drachm:

Let them be mixed together for one dose.

*Anti-dysenteric Pills of Yallhoy.*

Take very fine powdered bark of Yallhoy .. 1 scruple:  
Let it be mixed with gum tragacanth for one dose.

*Anti-dysenteric Pills of Extract of Yallhoy.*

Take extract of Yallhoy .. .. half a scruple :  
Form pills with gum tragacanth for one dose.

*Anti-dysenteric Clyster of Yallhoy.*

Take dry bark of Yallhoy well bruised .. half an ounce,  
Common water .. .. two pints :  
Boil in a close vessel till a fourth part of the liquor be consumed ; then strain it through a linen cloth, for two clysters.

The Physicians of Huanuco usually prescribe as many as three doses a day of the infusion, and two clysters, ordering at discretion the quantities of bark which the case may seem to require.

Having been unable to ascertain correctly the determinate quantities allowed by those Physicians for infusions and clysters, I have proposed, as already stated, for the dispensation of this new medicine, the above formulæ, as most conformable to other medicines now in use, until they shall be regulated by experience, and proper proof shall decide the doses to be daily administered.\*

I have excluded, as useless for medicinal purposes, the ligneous part of the root of the Yallhoy, having found in it no perceptible smell, juice, or substance of any kind analogous with those found in the barks.

\* Doctor Thomas García Suelto has been commissioned by the Royal Medical Academy of Madrid to make experiments with this new anti-dysenteric remedy in the General Hospital of that metropolis, and has reported to the Academy, that he has cured with this medicine two patients who were afflicted with dysentery ; that he followed the method proposed in this dissertation ordered to be published in the second volume of the Academical Transactions. I have also received communications from Doctors Ignacio Ruiz of Luzuriaga, and Eugenio de Arrieta, stating that the Yallhoy has operated promptly and efficaciously in various cases in which they have dispensed this new anti-dysenteric remedy in the quantities and the method above prescribed.

*Results obtained from the bark of Yallhoy by the following Analysis.*

1. I placed in a flask, capable of containing four pints, twenty-four grains of very fine powdered bark of the root of Yallhoy, with six ounces of cold distilled water, and having shaken it for a short time, the liquor was converted into a thick foam occupying the whole cavity of the flask. The foam remained in that state for a considerable time, and though after opening the flask it began to subside less slowly than when the flask was closed, and to re-assume the liquid state, the whole did not entirely subside within the flask, even for the space of twelve hours; but having placed the fluid in an open dish, all the foam disappeared in two minutes, doubtless from the greater influence of oxygen upon the liquor when exposed to the action of the atmosphere, than when kept close. I returned the liquor again into the flask, and as often as the operation was repeated, there resulted the same quantity of foam and the same consequences. All which proves the existence of a portion of saponaceous matter in the bark.

The liquor dissolved more than half the weight of the bark, and assumed a tint similar to that of depurated whey when filtered without clarification; and having added a little carbonate of potash, it acquired a yellow colour, similar to the *Reseda luteola* or woad. With sulphate of iron there was no remarkable alteration in the colour, nor any precipitate at the time; but in a few minutes a mucous and greyish matter settled at the bottom of the vessel, and the liquor remained clear. In the residue due the acrid bitter flavour was perceptible, though in a slight degree.

2. I infused for three days other twenty-four grains of the powders in an ounce of alcohol, cold. The liquor was in a short time tinged of a clear yellow, and acquired a very perceptible bitter and sharp acrid taste, like that of the root when chewed. During the three days no foam was perceived; notwithstanding the liquor being shaken. The tincture, when diluted in distilled water, did not become turbid, nor was there any perceptible sediment.

The alcohol dissolved half the weight of the powders, and they remained insipid. The excess in weight of the powders in the former dissolution, shows that the alcohol could not dissolve the mucilage that was soluble by the water.

3. I infused half an ounce of the powders in four pints of cold distilled water; after twelve hours I caused it to boil a considerable time in a suitable vessel without luting the junctures; when taken from the fire and sufficiently cooled, I strained and filtered it; and the result was a yellowish tincture, like that produced by the infusion in alcohol. The liquor being evaporated, yielded a drachm and a half of extract of solid consistency, without any adhesive property, shining, and of a dark grey colour, somewhat resembling the resin of jalap, which in a few days became much harder, lost some of its lustre, and remained friable and not so dark coloured.

4. From another half ounce of the powders I obtained, after repeated cold infusions, a pale gold-coloured tincture, which when evaporated yielded three drachms of extract, less shining when dry than before, and laminated, but equally friable after some days, and of a rather ashy grey.

5. Having burnt half an ounce of bark, it was with difficulty reduced to ashes of a blackish colour, until they were consumed to half a scruple, when they became somewhat white. They

contained little calcareous matter, some magnesia, and a small portion of silex.

6. Though no aroma or fragrance of any kind was perceptible in the barks, I placed two ounces of them for distillation in water, to ascertain if they contained any essential oil; and though I purified the distillation, nothing was observable on the surface of the water when placed in a narrow-necked vessel.

7. From what is here stated the result is, that in the barks of the root of the Yallhoy the extractive principle is most abundant, and in it resides the stimulant virtue perceptible in the bark itself; that this extractive principle is mixed with a little mucilage, for which reason at first the acrid flavour is not noticed, which is afterwards experienced on chewing the root, and which is subsequently manifested when after dilution of the mucilage the extractive principle is separated. For the same reason the acrid bitter flavour is not perceptible in the aqueous as in the spirituous infusions, because in the former the two principles remain united, and in the latter the extract alone is disengaged.

8. That the stimulus and the virtues of the bark reside in the extractive principle, is proved by its property of dissolving in water, and in pure spirit of wine or alcohol, and by its facility of oxygenization; since on adding a few drops of nitric acid to a little of the infusion, its colour changed after some time; and it is already known, that the extractive principle is that which suffers most modifications by the oxygen, taking regularly a duller colour when exposed to the open air.

9. I lastly proceeded to examine the extract, for the purpose of ascertaining whether (as I suspected) the extractive principle abounded in it. I remarked that a portion of it did not dissolve in water; and as I was sure that this residuum was not burnt,



and was not of a carbonaceous nature, since the greater part of it dissolved in alcohol, my suspicion was realized by means of ammoniac and the solution of zinc, which precipitated it in foliaceous flakes of a dark colour.

---

*Diagnostic characters which good and well selected Bark of Yallhoy ought to possess.*

It is to be remembered, that the barks of the root of the Yallhoy are to be entirely separated from the ligneous part in sticks or little tubes, from a sixth to half a yard in length, and they are to possess the following characteristics, when well collected and preserved.

*Thickness* of the tubes—from half an inch to two inches in circumference, and the edges rolled inwards one over another, and sometimes each by itself, forming in this case a double or fluted cane.

*Surface*—longitudinally furrowed, by a few fissures, caused by the separation of the little roots which were in those parts.

*Exterior colour*—between a straw and bay colour, and mostly with clear greyish spots.

*Interior colour*—dark tawny. The liber of a pale white. The powder, of a whitish yellow colour.

*The liber*—from half a line to a line in thickness.

*Consistence*—compact, like a thin cake of common glue.

*Fracture or cutting*—of considerable resistance, and equal, without being torn or fibrous at the edges.

*Specific gravity*—with respect to the consistence, somewhat considerable.

*Concrete juice*—abundant and glutinous.

*Smell*—earthy, weak, not unpleasant; but when reduced to powder and taken into the nostrils, it stimulates actively, so as to cause sneezing, and abundantly promotes the mucous discharge.

*Taste*—sharply acrid, acid, bitter, so soapy and mucilaginous, that on chewing a little of the bark the mouth is filled with a thick viscous and tenacious froth, especially on the lips, the acrimony remaining a long time both on the tongue and palate, so as in some degree to excite nausea.

## DESCRIPTIO BOTANICA YALLHOY.

CLASS XVII.

### DIADELPHIA OCTANDRIA.

#### MONNINA.

*Syst. Veget. Flor. Per. et Chil. p. 169.*

#### *Monnina polystachya.*

M. foliis ovato-lanceolatis ovatisque, paniculis polystachyis, drupis apteris. *Syst. Veg. Flor. Peruv. et Chil. p. 171.*

*Planta*—fruticosa, villosa.

*Radix*—bipedalis, perpendicularis, simplex, fusiformis, supernè, 1-2-pollicaris, infernè sensim angustata, albido-pallescens, paucis

fibrillis, remotis, tenuibus, longis, meditullio lignoso, albido, sub-inspido, facilius à cortice secedente. Cortex crassitudine ut plurimum bilineari, dum siccus characteribus supra dictis præditus.

*Caulis*—erectus, 2-3-ulnaris, teres, infernè indivisus, superne ramosus.

*Rami*—teretes, flexuosi, diffusi, nutantes: teneri villosissimi, parum purpurei, foliosi.

*Folia*—alterna, patentia, petiolata, ovato-lanceolata; plurima ovata, acuta; nonnulla oblonga, obtusa; integerrima, undulata, mitia, supra glabriuscula, subtus villosa, venosa; venis alternis, incurvis, ut plurimum bipollicaria, latitudine pollicari.

*Petiole*—1-2-lineares, semiteretes, supra sulcati, basi incrassati, parum incurvi.

*Pedunculi*—ex axillis superioribus terminalesque, polystachyi, paniculati, nutantes, villosi.

*Spica*—flexibiles, 3-6-pollicares, multifloræ.

*Flores*—conferti, brevissimè pedicellati, erecti, bracteolâ subulata, flore duplò breviori, stipati.

*Calyx*—parvus, albido-cæruleus, deciduus, diphyllus: *foliolo* *superio* ovato, acuto, concavo-cymbæformi: *infero* breviori, semibifido: *laciniis* ovatis, acutis, concavo-cymbæformibus.

*Corolla*—papilionacea: *Vexillum* nullum, nisi carinæ apices parvi vices illius gerentes: *Alæ* duæ, subrotundo-obovatæ, planæ, cæruleæ, deciduæ.

*Carina*—compressa, concava, superne ventricosa, alba, apice luteo, decidua: *Appendix* carinæ (aut staminum vagina) monophylla, subconvoluta, basi carinæ inserta, utrinque acumine brevi, palato villosa, pistillum amplexans, cum cæteris floribus partibus decidens.

*Filamenta*—octo, carinæ apici inserta, subulata, villosa, quatuor ad singulum latus, alternis brevioribus. *Antheræ* erectæ, biloculares, apice veluti in duo labia dehiscentes.

*Germen*—ovatum, corpore glanduloso, versus foliolum calycis superius productiori, persistente cinctum. *Stylus* simplex, incurvus, infernè attenuatus. *Stigma* simplex, latiusculum, truncatum, compressum, utrinque denticulo acuto, altero reflexo.

*Drupa*—pendula, ovata, nitida, lævigata, succosa, parvi pisi magnitudine, monosperma.

*Nux*—osseo-coriacea, fulvescens, oblongo-ovata, subanceps, unilocularis, punctis excavatis inæqualibus rugosa. *Nucleus* ovatus, albus, cotyledone gemino.

*Habitat*—in Peruvæ Andium montibus ad Panatahuarum provinciam, versùs Pati, Sirabamba, Acomayo, Pillao, Panao, Chacilla; et in Tarnæ provincia prope Huassahuassi, Palca, Huayabal, Huychay, et Morocamcha.

*Floret*—Augusto, Septembri, et Octobri.

*Vernacule*—in Huanuco, *Yallhoy*; in Pillao, *Masca*.

The Yallhoy grows on low peaks, and on the skirts of high ones, among small shrubs, bushes, and herbaceous plants, and is easily distinguished from all others by its beautiful spikes of blue flowers, variegated with white and yellow, and by its little fruits of a blueish purple, which when very ripe appear black. These spikes overtop many of the others considerably, waving and inclining toward the earth like a plume of feathers; and for this reason the plant is distinguished in Pillao by the name of *Masca*.

Those tracts of land, according to their greater or less elevation, are more or less fruitful, and consequently some are colder than others. In the cold tracts the plants are less villous, less branchy, and of smaller size than those which are found in lower, more sheltered, and temperate situations.

As such situations occur at the base of the Royal Mountains, or





MONNINA *polystachya*.

Widdell, fruct.

the woody regions of the Andes of Peru, between the tropic of Cancer and the Equinoctial line, and from 9 to 11 degrees south, the vegetation of the Yallhoy is there perennial ; for though the nights are considerably cold, it never snows or freezes in those places, nor does the mercury or spirit of wine in Reaumur's thermometer descend lower than five degrees above zero, and the greatest heat experienced at mid-day does not exceed twenty-four degrees of that thermometer.

There are frequent rains from October to May ; but the plants obtain some sunshine, though for short and casual intervals, in almost all the cloudy and rainy days of the year.

---

#### EXPLANATION OF THE PLATE.

---

1. Flower with the carina erect, and the alæ open. 2. Flower with the alæ and carina expanded, shewing the stamens. 3. Lateral view of the flower. 4. Calyx. 5. Calyx magnified. 6. Petal seen on its interior face. 7. The carina declining. 8. The carina erect. 9. Appendix of the carina, with the stamens declined. 10. Appendix of the carina erect. 11. Stamen. 12. Stamen with the anther open. 13. Pistil. 14. Pistil magnified. 15. Drupe. 16. Nut. 17. Transverse section of the nut. 18. Kernel.



**MEMOIR**  
 ON THE  
 VIRTUES AND USES OF THE PLANT  
 CALLED IN PERU  
**THE STAR - REED;**  
 (BEJUCO DE LA ESTRELLA.)

---

BY DON HIPPOLITO RUIZ,  
 FIRST BOTANIST TO HIS MAJESTY IN THE EXPEDITION TO PERU,  
 &c. &c. &c.

---

**PRELIMINARY NOTICE.**

As often as I have examined the Virginia Snake-roots brought to us from Virginia by the English for medicinal purposes, I have found them ill assorted, and mingled with different roots of other unknown plants, so intimately intermixed with the genuine ones, that the most acute and discriminating physician could scarcely distinguish them. I immediately conceived the idea of announcing this observation by means of the Memoir which I was about to publish on the Star-reed, to be presented to the Royal Medical Academy of Madrid, in order that, if approved, it might be inserted in the second volume of their Transactions.

The Royal Academy sanctioned it, and permitted its insertion in that volume, along with other Memoirs destined for the press; but the publication being unavoidably delayed, and the Academy being desirous that the Memorial should appear as early as possible, they proposed to me to publish it myself separately; which I now do for the benefit of mankind, and to supplant advantageously the highly lucrative branch of commerce carried on by the English in Virginian Snake-root to all parts of the world, by substituting the Star-reed, which not only admits of no similar admixture of other roots like that, but, being a species of the same genus, possesses the same virtues, and even in a stronger degree, and is besides susceptible of various other medical applications unknown in the Snake-root; besides which, the Star-reed is a drug of greater interest to Spain; because, growing abundantly in her American possessions, it will constitute, as already observed, a new and considerable branch of national commerce, if, according to reasonable expectation, the knowledge of its virtues and uses be diffused in Europe, and if that preference be given to it over the Virginian Snake-root which it deserves for the reasons above stated.

NOTE.—It would be of the greatest importance if Government would order the Viceroy of Peru to send supplies of the Star-reed, in order to contravene the exclusive trade of the English in Virginian Snake-root, or at least to save Spain the annual sum drawn from her by them for this article. Meantime the Virginian root might be tolerated, on condition of not admitting into our ports, and through the frontiers of Portugal or France, any supply of it without strict scrutiny that it be clear of other roots with which it is always found mixed; and that it be always of the pale straw colour natural to that which is in good condition; because it would be a less evil to be without Snake-root, than to administer it to the sick in a decayed state, or mixed perhaps with deleterious roots.

AMONG the multitude of vegetables which grow spontaneously and clothe on every hand the cascades, rivulets, banks, valleys, and high and low peaks of the extensive and rugged mountains of the Andes of Peru, not a few are found, which by their properties, virtues, and uses, merit a preference in the attention of naturalists, physicians, and merchants. One of these vegetables is the plant called in Pozuzo and other towns bordering on the frontiers of the native Indians, the Star-reed, or *Bejuco de la Estrella*; because its root and stalks, transversely cut, present on both sections many rays, diverging from the centre of the ligneous part to the circle formed by the bark, with which they represent a star, or rather wheel with many radii.

The natives of Pozuzo, Cuchero, Pueblo Nuevo, and Huanuco, give this plant the name also of *Contrayerva de Bejuco*, perhaps from its efficacy in those diseases in which the *Contrayerva* of the apothecaries, or the *Dorstenia Contrayerva* of Linnaeus, is administered, or from some resemblance to the latter in the peculiar and grateful fragrance which it exhales. But this name of *Contrayerva*, applied by the natives to the Star-reed, ought not to be admitted in *Materia Medica*, it having been already applied to designate, as has been before shown, the root of a very different plant.

The independent Indians of Peru greatly value the root and stalks of the Star-reed, as a remedy for dysenteries, malignant inflammatory fevers, colds, rheumatic pains, and the various diseases arising from fatigue.

For each dose they take of the roots or fresh stalks a handful, large or small according to their size. This quantity they in-

fuse in boiling water, keeping the vessel covered for four or six hours, and at bed-time the infusion is taken warm, either by itself or with a little sugar.

They say that it causes them to perspire abundantly, and assert that in a few hours it alleviates their pains, generally effecting a cure within three days. In cases where entire relief is not obtained, they repeat the medicine two or three times, until they are freed from pain or other inconvenience.

The Indians also apply the Star-reed pounded or bruised, fresh, to the bites and stings of reptiles and insects, as a powerful antidote against their poison.

The great estimation in which the Star-reed is held by the Indians for such disorders, the peculiar fragrance which it exhales on cutting, and the exquisite camphorous, balsamic and bitter flavour which I discovered in it, excited in me the most lively wish to make myself acquainted with the plant.

Notwithstanding the most diligent researches in the woods, I was for two years unable to meet with the plant in flower or in fruit, and had at length recourse to the expedient of transplanting some specimens of it into the garden at Buenamuerte de Lima, distant a hundred and five leagues from Pozuzo, where it flowered in the months of January and February; a period which, on account of the continual rains, was by no means favourable for exploring the mountains where it abounds, as I had done in seasons when there were few showers.

By its flower I perceived that the Star-reed belongs to the genus *Aristolochia* of Linnæus. The genus being ascertained, no impropriety could arise in recommending to the Faculty the use of this new remedy, according to the application made of it by the Indians.

In my recommendation I added a suggestion that Physicians

might use it instead of the *Aristolochia serpentaria*, especially against nervous, intermittent, and putrid fevers.

A short time after having remitted to Lima some stalks and roots to the celebrated Dr. Cosme Bueno, with a notice on the use made of them by the Indians, and on that to which this new medicine might be applied, I had the satisfaction to receive repeated thanks from him, with an intimation that the Star-reed operated with greater efficacy and certainty than the Virginian Snake-root.

From that period I diligently continued to make daily observations and experiments on the Star-reed; and having a few months before my departure from Peru for Spain, remarked that on being masticated it caused an abundant and viscous saliva, I inferred that it might be useful against tooth-ache, and advised several persons, frequently subject to that complaint, to make use of this new medicine. The patients in a few hours after taking a small piece into the mouth, and repeatedly emitting the saliva, actually experienced considerable relief, and, by continuing the use of it, were cured for the time of this disagreeable pain.

Well assured by repeated experiments of its odontalgic, antiseptic, and soothing properties, I transmitted to R. P. Francisco Gonzalez Laguna, a member of the religious order of the Agonizantes of Lima, and a commissioned correspondent of the Royal Botanic expedition, a packet of the Star-reed from the mountains of Pozuzo, in order that observations and experiments might be made upon it in the capital of Peru.

So many persons daily flocked to the cell of this friar, as soon as the remedy became known, that in a short time the packet of Star-reed was consumed, and the father requested of me another packet, that he might distribute gratuitously, as he had

done the former, this new and efficacious medicine among the sick. On my departure from Lima for Spain this second supply had been already distributed:—a proof of its virtues as an odontalgic.

Lastly, I found that by frequently keeping a small piece of the bark of the Star-reed in the mouth, its pungency and fragrance prevented the perception of the bad smell and putrid miasmata peculiar to the breath and perspiration of some persons, and especially that odour which is perceived on entering hospitals and rooms of sick persons which are ill ventilated: therefore this plant deserves to be recorded as one of the best vegetable medicines against fetid miasmata, and preferable to the roots of the *Iris Florentina*, *Ginger*, *Calamus aromaticus*, *Galanga*, &c. and as an efficacious remedy by which persons may correct or remove the smell of bad breath. The effects produced in Peru were experienced in Madrid by several who used the Star-reed for the tooth-ache, keeping in the mouth a small piece of the bark, in which, as is the case with many roots and stalks, the virtue resides; because in the ligneous part, where there are no manifest juices, the flavour peculiar to the bark is scarcely perceived, after the latter has been well separated from the former by pounding it in a mortar till it remains entirely clear from the ligneous part.

Some physicians of the court of Madrid, to whom the properties, virtues, and uses of the Star-reed in Peru were represented, have already begun to administer the powder of its bark in those cases in which that of the Virginian Snake-root is prescribed, substituting for half an ounce of the latter two drachms of the former with two ounces of bark for opiates; and they assert that the bark of the Star-reed takes effect more promptly and forcibly than the Snake-root:

The same gentlemen of the faculty have administered this new medicine in powder, without the addition of Peruvian bark or other medicines, the dose being from half a drachm to a drachm, and its effects have always answered expectation.

The Star-reed, like the Virginian Snake-root, belongs, as we have observed, to the genus *Aristolochia* of Linnæus; hence the resemblance of their properties and virtues cannot be doubted: but the Star-reed has the advantage of a more fragrant, grateful, and permanent odour, and of a more exquisite camphorous, balsamic, and bitter flavour than the Snake-root: it must therefore be more active in its effects, in all cases requiring the exhibition of Snake-root: consequently Star-reed is more estimable, and claims preference over the Snake-root in *Materia Medica*.

In addition to these solid reasons, there are others still more powerful, for substituting the use of the Star-reed for that of Snake-root.

1. Because the cuttings of the stalks and roots of the Star-reed, as gathered by the Indians, long, thick, and with strongly marked characters, admit of no mixture, nor can they be confounded with parts of other vegetables, as is the case with the Snake-root, which being very slender can readily be mingled with those of many other plants having roots equally slender, and similar in form and colour, though very different in their properties.

2. Because the thick bark peculiar to the stalks and roots of the Star-reed, is easily separated by twisting or breaking them from the woody part, which like that of the Snake-root is almost insipid and inert; and the whole bark may be reduced to powder alone, without any particle of the ligneous heart: this operation is impracticable with the small roots of the Snake-root,



by reason of their extreme tenuity; and for this reason they are always ground with the ligneous part.

3. Because in Spain we seldom obtain the Snake-root in good condition; it is commonly blackish, instead of a pale straw colour, full of earth and bits of the stalks, leaves, and unripe fruit of the plant; and, what is much worse, mingled with cuttings of forked stalks, which by their figure and articulations are indicated to be of a small species of *Euphorbia*, with numerous seeds, and other unknown substances, and a multitude of little roots of different plants, so intimately entangled with those of the Snake-root as to appear one and the same; from which circumstance it is difficult for physicians to distinguish the genuine from the spurious, even if they all, as it is to be hoped, attend to the selecting and cleansing of them; because they are commonly, when taken out of the cases or packages, broken, mixed with earth and dust, and almost always half decayed, or at least mostly deprived of that natural colour, flavour, and fragrance, perceptible in those which are well packed and carefully preserved.

4. Because merchants and druggists, who never attend as they ought to prevent their being damaged, to the cleansing of the simples which they dispose of, at an arbitrary and exorbitant profit, not only to apothecaries, but also to those who cannot discriminate, as they do, between the useful and beneficial and the useless and noxious, sell the Snake-root, as well as most other vegetable drugs, in a broken and almost pulverized state, and with little roots and filaments of other plants growing among them, together with other spurious substances; and in this condition the medicine is administered to the sick by persons ignorant of physic, not a few of whom often purchase from druggists with the prescriptions of medical men, not only it,

but the other simples in common use, as well as various other compounds and preparations either in larger or smaller quantities.

There is no other reason for these irregular sales and purchases, except that the articles are to be obtained cheaper from druggists than from apothecaries; the purchasers, and those who send them, not reflecting that such articles are not genuine, some of them ill assorted and in worse condition, others adulterated or of debased quality, as pulverized Peruvian bark, and that of the worst quality, the damaged and deteriorated, which as they cannot be sent in the natural state to the intelligent, are all pulverized; to those which have no astringency or good colour are added portions of the very bitter bark of *Calisaya*, and almost always bitter almonds, that they may not waste away in dust, and that the colour and flavour may be revived to suit the prejudice of the vulgar, who think that the bitterest bark is the most efficacious; an error indeed very difficult to eradicate from the ignorant multitude, as many persons endeavour to propagate it, for the purpose of vending the quantities of bark which unfortunately have been introduced among us by merchants, with the view of offering them cheaper than those of *Loxa fina*, *Peruviana legitima*, *Delgadilla*, *Anteada colorada*, and that of *Calisaya*, which have been hitherto acknowledged as the most efficacious in medicine.

Purchasers also find *extract of bark* to be cheaper with the druggists than with the apothecaries; but they are ignorant that it commonly contains one-third part of impurity, and is also burnt, and not of a proper consistency. Having all these defects, the current price of the Extract in commerce is three dollars a pound, and the merchants and druggists derive greater profit from this than from the well elaborated extract, which costs them eight or ten dollars a pound.

The druggists are also accustomed to sell the extract of opium mixed with a portion of gum arabic, which is added by those who work for the druggists, to augment its weight, and to give it even greater consistence and brilliancy than it ought to have, and hence arises the low price at which it is afforded by the druggist. Such an Extract cannot produce the effects which the Faculty expect, because neither they nor the purchasers from the druggists can know the relative quantities of opium and of gum in each portion of such a mixture.

Among the many articles which are usually bought from druggists by the unskilful, *Opium* is found without that indispensable purification which it requires when intended to be used internally, by means of which physicians separate the quantity which it contains of wax, sand, earth, leaves, seeds, and other impurities added by the Asiatic factors for the sake of gain. And, to conclude this digression, they also vend *Tartar emetic* and other medicines, all prepared without careful attention, and without the relative quantities of each ingredient prescribed by the Pharmacopœias; and they are all dispatched empirically, without order, without method, and without the responsibility required from the apothecaries: from all which abuses there must necessarily result continual disappointments, which are sometimes attributed to the physicians, to the disparagement of their reputation and interests.

I have in almost every instance separated from two to five ounces of earth and other impurities from each pound of Virginian Snake-root. On the present occasion I separated from four pounds of Snake-root which I purchased, twelve ounces of earth and six ounces of various little roots, sticks, bits of straw, wool, down, moss, and numerous other spurious substances, which I give as evidence of the fact to this illustrious Academy.

I also separated from the same four pounds of Snake-root, six ounces of the root itself black and putrid, like that in the present sample, which cannot in any way be used internally.

The result of the examinations which I have repeatedly made is, that in the Virginian Snake-root, a fourth part commonly consists of impurities, and of some roots which, though very like the genuine ones, belong to different plants, as well as of other roots differing in thickness, shape, size, colour, and flavour, intimately interwoven with the others during their growth, the properties of which are with difficulty ascertainable, though each specimen be individually subjected to a deliberate examination and analysis.

For these reasons, in order to avoid the evil consequences resulting to mankind from the use of roots so ill assorted and conditioned, it has appeared to me highly important to present to this learned body ~~a Memoir on the Star-reed, as preferable~~ for medical use to the Virginian Snake-root, being a plant of the same genus, and more efficacious in its virtues, because it admits no mixture with others, either naturally or artificially, and because we possess it in South America in such abundance, that all Europe may be supplied with it, as soon as the commerce is established, and at a much lower price in our own colonies than we pay to the English for the Snake-root; in order that, if the Academy think fit, they may enjoin their members to examine and make the necessary experiments on this vegetable production; and the virtues of the Star-reed being ascertained by so illustrious a body, they may insert the Memorial in their Academical Transactions, and recommend its use in preference to that of the Virginian Snake-root.

The approbation of the Royal Academy, should this paper deserve it, will serve as a compensation for my labour, and as the

greatest stimulus to my perseverance, with the same frankness I have hitherto used, and without availing myself of any reserves, as others have done to exalt unduly their meritorious secrets, in preparing and giving to the public dissertations on other new and valuable remedies; such as the Extract of Bark, made in Peru by the simple and exact method which I explained in my *Quinologia*, with the barks newly cut from the trees, the use of which, as well as of the bark, has been admirably diffused throughout Europe since the publication of that treatise; and they form at the present day two considerable branches of commerce, highly productive to the royal revenue and to Spain: the Root and Extract of the *Ratanhia*, a powerful styptic for restraining bloody fluxes in whatever way they originate, if the medicine be opportunely administered, and in proper doses;\* to give firmness to the teeth, and to consolidate relaxations and fractures, through which efficacious virtues its use is extending in all parts, and forms another branch of commerce sufficiently important. The admirable remedy of the root of *Yallhoy* against dysentery, in which disorder it operates with singular energy, as has been proved by experiments in Peru, as well as in the general hospital of this city by an individual of this Academy, and at the Society's expense: The remedy of the *Calaguala*, under which name have been

\* I have observed, that through want of skill with some persons in making a decoction of the roots of the *Ratanhia*, by depriving the dose prescribed in my dissertation of its extractive part, the medicine has sometimes failed of producing its effect so promptly as might be wished. I have also observed, that some of the Faculty having prescribed the Extract of the *Ratanhia* in small quantities, and diluted in much water, it has not operated with the efficacy desired, especially in urgent cases; in which the dose of the Extract, well elaborated, must be one drachm, or the eighth of an ounce, repeated four or more times a day, or every hour, as practitioners administer this remedy either in powder infused or boiled in water, or in the form of pills, when the patient or his stomach cannot admit it in the other modes,

and are ignorantly sold various cryptogamous roots, species of the same genus, and others wholly different, as, for instance, the common *Calaguata* of commerce, which is almost insipid, and of little or no virtue: hence the use and virtue of the genuine and very bitter plant of Peru have been unjustly depreciated; and occasion has been given for various physicians to write both for and against its sudorific and solvent properties; that of the *China Peruviana*, with an infusion or decoction of which, taken abundantly for some days, the Indians and other tribes cure themselves of rheumatic pains, and obstinate inflammatory and herpetic affections; that of the *Cunchalagua*, the infusion of which is frequently used for tempering, purifying, and attenuating the blood, for restoring the relaxed stomach to its tone, and for abating intermittent fevers; as a sudorific also it is of great use in pains in the side without fever; and finally the *Sargazo*, a remedy against the scurvy.

May the present paper be useful to mankind! for that is the reward to which I aspire.

Although, for the admission of the Star-reed into medical use, the single fact was sufficient, of its being, like the Virginian Snake-root, a species of the genus *Aristolochia* of Linnæus, and of possessing a fragrance and taste much surpassing those perceptible in the Snake-root; I have thought proper, for the greater satisfaction of physicians, to give some chemical experiments on the Star-reed, in order to exhibit its component parts, and the most important results for medical use, as follows:

*Chemical Analysis of the*  
**STAR - REED.**

As no method has been hitherto devised for exactly and completely analysing vegetable substances, without exposing their constituent principles, during the manifestation, by fire or by fermentation, to various alterations, and consequently producing results and new combinations which did not previously exist in them, I have confined myself to the following operations on the Star-reed, because, for ascertaining the properties, virtues, and uses of this new species of *Aristolochia*, they appear to be adequate, and have the least tendency to the destruction or decomposition of their principles.

1. In an ounce of pure alcohol I infused for three days twelve grains of powders of the bark of Star-reed, agitating it repeatedly, in order that the liquor might more easily extract from the powders the substances soluble in it. The alcohol became in a short time tinged with a beautiful gold colour, without acquiring any perceptible smell or taste; but a little of it being diluted in distilled water, a milky mixture was produced, having the fragrance and bitter taste of the bark, and thus indicating that the bark contained much camphorous resino-balsamic and extractive substance. The alcohol dissolved six grains, and the other six of the residuum remained without odour and tasteless. I infused these for eight days in an ounce of distilled water; it assumed no tinge, but in a short time afterwards became light blue, and remained so for eight days without perceptible fragrance or taste; a certain proof that the alcohol had dissolved all the extractive, colouring, camphorous, and resino-balsamic part of



the powders, and that only a little viscosity had remained in the residuum, which imparted the light blue colour to the water. Three grains, however, of the residuum were dissolved in the water, and there remained insoluble in the two fluids three of the twelve grains of pulverized bark which I had originally infused.

2. I placed other twelve grains of the powders in a cold infusion in an ounce of distilled water for forty-eight hours; it was tinged of a dull yellow colour, and the liquor and residuum possessed the smell and taste of the bark, though in a less active degree than had been emitted from the diluted alcohol in the former operation. With carbonate of potash, the filtered infusion was raised to a clear gold colour, but less beautiful than the tincture in the alcohol. With sulphate of iron it immediately became turbid, and formed a greyish precipitate; thus manifesting that the bark contains, though in a very small quantity, gallic acid, or the astringent principle. The water dissolved five grains, and the seven grains of the residuum I infused in half an ounce of pure alcohol, which became immediately tinged, and in a few hours acquired a gold colour almost equal to that of the first infusion in alcohol: when diluted in distilled water, the mixture became turbid, as in the first experiment, presenting the fragrance and bitter taste of the bark. The alcohol dissolved four grains of camphorous, resinous, colouring and extractive substance; and there remained three grains of residuum from the twelve grains of bark infused. From these operations the result is, that in both fluids nine parts out of twelve are dissolved, and three remain insoluble.

3. In an ounce and a half of alcohol I infused for three days forty-eight grains of pulverized bark of the Star-reed, and the liquor acquired a reddish obscure tinge: when diluted in water,

the mixture became entirely milky, having the fragrance and very bitter flavour of the bark; an evident proof that the bark contains a considerable portion of resinous substance:—and conformably to the results of the anterior operations, it may be calculated that the bark of the Star-reed contains one-sixth part of a camphorous and resino-balsamic substance, and  $\frac{5}{12}$  parts of extractive substance. This tincture, diluted in common water, produces a very bitter flavour, but not ungrateful or repugnant to the palate; and as soon as taken into the stomach it promotes transpiration, and excites eructations with very remarkable fragrance.

4. I infused twelve grains of these powders in an ounce of acetic acid or distilled vinegar: after some hours the liquor began to assume a very clear gold tinge, the fragrance was faint, and there was no bitter flavour perceptible. The acid dissolved one grain of the powders, the other eleven grains remaining insoluble. I infused a sixth part of the pulverized bark in six parts of acetic acid not distilled; and by means of distillation in a retort, after six days, a vinegar was obtained of very grateful fragrance, not at all resembling the vinegars of other vegetable substances.

5. For the space of forty hours I infused in twenty ounces of distilled water, half an ounce of pulverized bark of the Star-reed; I placed it for distillation in a glass retort, with a tubular receiver over a moderate fire. At the commencement of the distillation, I perceived that every time the stopper of the receiver was removed, there was a slight evolution of gas, accompanied by the fragrance of the bark; this fragrance increased as the distillation proceeded. Having distilled about seven ounces I suspended the operation, and when the vessels were cold transferred the distilled liquor to two phials, in which manipulation a certain white slender film, like cobweb, which floated on the

liquor, separated into white particles or flakes, such as are formed when camphor dissolved in the sun is poured upon water. In one of the phials which I kept closed and at rest for more than two months, the liquor remained clear, its fragrance unaltered, and the floating particles entire as on the day when the liquor was put into the phial. In the other, which I frequently unclosed and shook gently to observe the substance of the flakes and the fragrance, they both diminished gradually and slowly, the liquor still remaining clear, and only becoming rather turbid when the phial was gently shaken; but as soon as the larger flakes ascended to the surface of the water, and the smaller ones by their greater tenuity descended, the liquor again became clear. It is to be inferred from this result, that in the bark of the Star-reed there is a considerable portion of a concrete camphorous substance or essential oil, which floats on the surface of water, and which cannot be held in solution.

6. Having filtered the liquor remaining in the retort after the preceding operation, and evaporated it to the consistence of honey, I placed it in the sun under a glass, where it assumed the solid consistence of pure extract in small crystals of various facets, brilliant and transparent, much resembling in colour and consistence the resin of jalap, and having a bitter acrid taste with little fragrance. The quantity of very pure extract was forty-eight grains. In the residuum there remained a hundred and eight, so that in distillation the half ounce of the powders lost in weight a hundred and thirty-two grains. We must infer that a part of this quantity combined with the water, part floated in the form of a camphorous substance, and part was dissipated in gas. The remainder was without taste or smell, the colour of the powders having varied little, and become somewhat paler.

7. I infused half an ounce of the pulverized bark in thirty-two ounces of very hot water for the space of two hours; I then took off the liquor, which was well tinged, and put to the remaining powders the same quantity of boiling water for the same space of time, shaking it occasionally; and when it had settled, I separated the second infusion, which was much more slightly tinged than the former. On the residue I poured sixteen ounces of hot water, and though I shook it more frequently than the two preceding infusions, the water was not at all coloured. I filtered the three liquors when cold, and evaporated them to the consistency of honey, and afterwards in the sun under a glass, to a solid consistency. There resulted forty-three grains of pure dry extract, having all the characters of that produced by the sixth operation. The residue weighed two drachms and a half, having a slight bitter taste with very little smell. The original half ounce of powders lost sixty-five grains of its weight.

8. In twelve ounces of pure alcohol I infused for ten days in a glass vessel, two ounces of the pulverized bark, and on shaking it repeatedly a beautiful and rather lively reddish tint was produced, which after filtration was finely transparent, and of a much brighter colour than the tincture of amber. The residuum was clearer than the powders before infusion, with a bitter taste and very little smell. I infused this residuum in an equal quantity of alcohol, which assumed a pretty strong tinge; but when poured into water it did not become turbid, or manifest the slightest resinous or milky appearance, like that of the first infusion, a few drops of which immediately imparted this milkiness to an ounce of distilled water; a proof that the first alcohol dissolved all the resinous part, and the second was

tinctured with the colouring and extractive part which the former had not completely dissolved, being already well saturated.

9. I placed half an ounce of the powdered bark to burn in a crucible, and it yielded thirteen grains of greyish ashes well charged with potash, which immediately manifested itself by pouring to a grain of the ashes, diluted sulphuric acid; a considerable effervescence was produced each time that the operation was repeated. From half an ounce of the ligneous part of the Star-reed, also burnt in a crucible, there resulted nine grains of ashes less grey, but also charged with potash, perceptible by the effervescence produced by the same acid.

10. In order to ascertain the quantities of pyroligneous acid and empyreumatic oil contained in the bark of the Star-reed, I placed for distillation half an ounce of the powder in a small retort. There remained in the retort two drachms of carbon quite black; in the tubular receiver I found two scruples of empyreumatic oil, thick and of a black reddish colour; and a drachm of pyroligneous acid of a pale colour, inclining to that of honey. About the weight of a scruple escaped in the form of gas through the tube or the stopper of the receiver. Some drops of the pyroligneous acid being placed in half an ounce of blue tincture of flowers of mallows, the fluid immediately became red, as is the case with sulphuric acid; but the lively colour gradually faded into that of white wine. I repeated five times the addition of the tincture of mallows to the liquor which had lost its red colour, and each time it again became red, with the difference of altering and losing colour more readily on the second addition, and so progressively in the succeeding ones, and the liquor contained in the glass remained of a bay colour, each time becoming darker. In another glass I put an equal quantity of the same tincture of flowers of mallows, which having

become red by the addition of a few drops of pyroligneous acid, assumed a beautiful green, on the addition of carbonate of potash; but in a short time it lost this green colour, as the red had disappeared in the former operations, and subsided into the colour of mead or white wine.

From these chemical products it must be inferred that the virtues of the Star-reed reside in the extractive resinous and aromatico-camphorous properties; and from this conclusion it appears to me, that to make proper medical use of this new medicine, the following simple preparations or formulas will be sufficient for the present; meantime skillful physicians may adopt them, or others more appropriate.

---

## FORMULAS;

OR

PHARMACEUTIC PREPARATIONS FOR THE USE OF THE  
STAR-REED.

---

### *Powders of the Star-reed.*

Take any quantity of Star-reed, break it sufficiently to separate the bark from the woody part; this may be separated as useless in the present preparation, or may be laid aside for the purpose of preserving the little extract which it contains. Reduce the bark to a fine powder, and preserve it, in a glass vessel well stopped, for use when required.

The regular dose is from half a scruple to half a drachm, instead of a drachm and a half of pulverized Virginian Snake-root well assorted and conditioned, and it will produce better effects.

*Infusion of the Star-reed.*

Take of the Star-reed well bruised . . . . half an ounce,

Common water, boiling . . . . . twelve ounces :

Infuse in a vessel well-stopped for three hours, shaking it repeatedly. Strain it when cold through a linen cloth.

It will serve for two doses.

*Decoction of the Star-reed.*

Take of Star-reed well bruised . . . . half an ounce,

Common water . . . . . eighteen ounces :

Place in a well-closed vessel, and boil gently for half an hour; take it from the fire, and when cold strain it through linen.

It will do for two doses.

*Essential Water of Star-reed.*

Take of Star-reed well bruised . . . . . 4 ounces,

Common alcohol . . . . . 6 ounces,

Common water . . . . . 6 pints :

Infuse in a vessel for three days; distill to one half in a retort with a tubular receiver to give passage to the gases, and with a moderate fire. When cold, put the distilled liquor into a well-stopped flask, and reserve it for use.

This water is preferable to that of the simple camphorated *Melissa*, and to other palliative remedies usually administered against flatulency and hysterics, on account of the greater portion of camphorous substance which it holds in solution by means of the alcohol, which is wanting in *Melissa*, and also on account of the resino-balsamic substance with which it is impregnated, and which is likewise wanting in *Melissa*.

The dose is one ounce.



*Extract of Star-reed.*

Take Star-reed well bruised . . . . . 1 pound,

Common water, boiling . . . . . 8 pints:

Infuse for two hours in a suitable matrass or vessel, shaking it repeatedly. Leave it to settle, and when cold pour off the liquor: to the residuum add boiling water four pints.

Shake, and proceed altogether as before, and to the residuum add two pints of boiling water.

If the third quantity of water comes off tinctured, repeat the operation until the water is withdrawn without taste or colour.

Unite the liquors, and having filtered them through paper or sand, let them be evaporated until the extractive part acquires the consistency of honey; then transfer the extract to a dish, and the solar heat, or a stove, will reduce it to a solid consistency, which may be ascertained by pulverizing a little of it in a glass mortar, or rubbing it between the fingers. In this state it may be wrapped in paper and preserved for use.

The dose is from ten to eighteen grains.

It may be administered in pills, or dissolved in boiling water, as must be done with all vegetable extracts, that they may be well dissolved.

*Essence or Tincture of Star-reed.*

Take of the pulverized bark of Star-reed . . . 2 ounces;

Pure alcohol . . . . . 17 ounces:

Infuse for eight days in a matrass, shaking it from time to time, that the whole tincture may be the more effectually extracted by the alcohol. Filter, and keep for use in a glass vessel well stoppered.

This beautiful essence is a digestive and corroborant stomachic;

of admirable use against flatulency; it promotes digestion, and in general causes eructation for some time.

Put for each dose, in a tumbler of common water, from twelve to forty drops, as the case may require.

This medicine may be kept in store, for domestic use, instead of Carmelite Water, or other tinctures or elixirs.

*Vinegar of the Star-reed.*

Take of the Star-reed well bruised . . . . . 18 ounces,

Acetic acid or common vinegar, very strong . . 9 pints:

Infuse for four days in a glass flask, and distil in a retort with a tubular receiver, to two-thirds; keep it well stopped in glass vessels for use.

It is an excellent preservative against putrid miasmata, and by its fragrance neutralizes the bad smells of hospitals and rooms ill ventilated.

*Compound Vinegar of Star-reed.*

Take Star-reed well bruised . . . . . 8 ounces,

Heads of lavender and thyme, each . . . . . 5 ounces,

Acetic acid . . . . . 9 pints:

Infuse for four days in a glass vessel with a tubular receiver, to two-thirds, and keep it in phials well stopped for use.

It answers the same purposes as the former, and when diluted in a sufficient quantity of common water, serves to refresh and wash the hands and face, especially in hot weather, and, on a journey, to remove from the skin the tan, caused by the air and sun.

*Characters peculiar to the cuttings of the Stalks and Roots of the Star-reed when in good condition.*

*Length*—As the Indians, in order to preserve the roots and the lower and useful part of the stalks of the Star-reed, are accustomed to cut them in pieces of various sizes without attending to any fixed standard, the length of the cuttings, varying from nine to eighteen inches, is no certain character: neither is the crookedness of some of them, since others are more or less straight.

*Thickness*—As there are stalks and roots from one to eight inches in circumference, the thickness is no exact criterion of distinction.

*Surface*—When the stalk and roots are well nourished, the surface is more or less smooth, and free from the scurf or fissures with which the stalk is covered when it has not attained its due maturity, and from the furrows and wrinkles that are formed after drying, when they have been untimely gathered. The bark within is full of wrinkles impressed on it by the layers of the ligneous heart. When the stalks are very old, they are covered with wrinkles and a shrivelled substance wholly useless.

*Outside, or exterior colour*—Ash grey and earthy, uniform throughout its length.

*Interior colour*—On the two ends or sections of each piece the bark is more or less of a whitish ash colour, and the heart of a pale straw colour; though the interior of the bark, throughout its length, is greyish brown inclining to purple, and the heart or ligneous part between livid and dark grey.

*Consistence*—very compact and solid in the bark, and spongy

in the ligneous heart ; from which the former separates easily on twisting the piece ; and the heart remains twisted like a cord composed of a multitude of layers or longitudinal sections, inlaid circularly with each other, so that a transverse section presents the figure of a star, or a wheel of many radii.

*Solidity*—from one line to four in well seasoned barks ; and in proportion as the bark is thick, compact, frangible, and separable from the ligneous body, in respect to the thickness of the cuttings will those cuttings be valuable, because in this case they have been gathered in the right season : but if the bark be thin, furry, wrinkled without, and not easily separable from the heart, the cuttings will have been from tender and unripe stalks, and for this reason there will not be the same fragrance and bitterness as in the others ; and the virtue will be less efficacious. In the interstices of the layers of the heart, there is a substance of the nature of bark, though in small quantity, which is with difficulty disengaged on pounding the woody part well, but it remains almost wholly reduced to powder.

*Cutting*—The bark from its solidity cuts every where alike, without leaving rough edges or inequalities ; the heart, being woody and laminous, cuts always unequally.

*Weight*—Well-grown and seasoned pieces are rather heavy in proportion to their thickness ; on the contrary, the ill-seasoned are very light.

*Juice*—extractive, resinous, concrete, abundant throughout the bark, forming with it a solid paste with brilliant points, sufficiently distinguishable on examining the cutting with a solar or reflecting microscope.

*Smell*—very fragrant, grateful, camphorous, and balsamic, much more active than that of the Virginian Snake-root.

*Taste*—at first sweetish, but afterwards becoming very bitter, stimulant, clammy, aromatico-balsamic conformable to its delightful odour.

---

## DESCRIPTIO BOTANICA.

CLASSIS XX.

### GYNANDRIA HEXANDRIA.

#### ARISTOLOCHIA FRAGRANTISSIMA.

*A. foliis cordatis acuminatis mitibus, caule fruticoso scandente, pedunculis 1-3nis unifloris brevibus. Flor. Per. et Chil. edend.*

*Planta*—fruticosa, scandens.

*Radix*—fusiformis, perpendicularis, longissima, usque ad sex pollices crassitudine, infernè ramoso-fibrosa, cinereo-fusca. *Cortex* à linea ad quatuor lineas crassus. *Parenchyma* transverse sectum in stellæ formam radiatum, albidum, post exsiccationem fuscum, funiculiforme, in plurimas lamellas flexibiles longitudinaliter scissile.

*Caules* 3-6 ex radice, ad arborum summitates scandendo-asurgentes, aut procumbentes, valde diffusi, teretes, flexuosi, 3-8 pollices crassi, fusco-ferruginei; infernè magis minusve ramosi, nudi; supernè ramosi, striati. *Cortex* et *Parenchyma*, ut in radice.

*Rami*—longissimi, teretes, striati, pubescentes, mites, tandem lanuginosi.

*Folia*—alterna, remota, longe petiolata, deflexa, cordata, acumine longo acuto, integerrima, membranacea, venosissima; suprà glabra, asperiuscula; subtùs reticulata, pubescentia, mitia, aliquando subferruginea; 2-3-palmaria, latitudine sesquipalmari.

*Petiolì*—foliis triplò breviores, teretes, striati, contorti, fusco-ferruginei.

*Pedunculi*—axillares, gemini, solitarii ternique, uniflori, teretes, petiolis quadruplo breviores.

*Corolla*—fusco-rosea, bipollicaris, intùs villosa, tubulosa: basi ventricosa, obtusè hexagona. *Tubus* teres, supernè sensim ampliatus. *Limbus* obliquus, lingulatus, apice reflexo.

*Antheræ*—luteæ, oblongæ.

*Capsula*—oblonga, obtuso-sexangularis.

*Habitat*—copiose in Peruvix Andium nemoribus, ad Pozuzo, Monzon, Chicoplaya, Tulumayu, et Huallaha.

*Floret*—in Januario et Febuario Limæ, quò a me translatae et cultae fuerunt nonnullæ plantæ juniores.

*Vernaculè*—*Bejuco de la Estrella* et *Contrayerba de Bejuco* audit.

*Observ.*—Indi Caules, qui funiculorum formam, si à cortice spoliantur, referunt, ad crassas restes conficiendas adhibent, et ex ipsis pontium funes construunt; quin etiam tuguriorum trabes totamque compagem vinciunt, firmantque cum prædictis caulibus, quos incolæ vernaculè *Bejucos* nuncupant, ubi ceteras quoque plantas scandentes, aut volubiles; quas tamen singulas aliquo semper appellativo nomine insigunt.

## DESCRIPTION.

CLASS XX.

## GYNANDRIA HEXANDRIA.

## ARISTOLOCHIA FRAGRANTISSIMA.

A. leaves cordate pointed smooth, stem shrubby scandent, peduncles 1-3 short 1-flowered. *Fl. Peruv. et Chil. edend.*

*Plant*—climbing, shrubby.

*Root*—fusiform, perpendicular, very long, about six inches thick, furnished at the base with branching fibres; of a grey ash colour.

*Bark*—firm, from one to four lines thick, the centre, when transversely cut, radiated, whitish, and, after drying, grey, and of the figure of a cord, splitting longitudinally into flexible lamellæ.

*Stems*—three to six from each root, climbing up trees, or, when wanting support, spreading along the ground, round, flexuose, from three to eight inches thick, grey or ferrugineous, naked, more or less fissured below; striated and branched above, with the heart and bark as in the root.

*Branches*—very long, round, striated, pubescent, and woolly at the extremities.

*Leaves*—alternate, remote, on long footstalks, deflexed, cordate, acuminate, smooth, thin, veined, naked above, roughish and reticulated beneath; soft and pubescent, sometimes ferrugineous; from two to three hands long, and one and a half broad.

*Petioles*—one-third the length of the leaves, thick, striated, twisted, of a brownish ferrugineous colour.



*Peduncles*—axillary in pairs, sometimes three, 1-flowered, round, one-fourth the length of the petioles.

*Corolla*—reddish brown, two inches long, downy within, tubular, ventricose at the base, and obtusely hexagonal; tube round, widening gradually above, limb or border oblique, tongue-shaped, apex reflexed.

*Antheræ*—long and yellow.

*Capsule*—oblong, obtusely six-sided.

*Grows*—spontaneously and abundantly in the Andes of Peru, in the woods of Pozuzo, Monzon, Chicoplaya, Tulumaya, and the banks of the famous river Huallaha.

*Flowers*—in January and February at Lima, whither I transplanted and cultivated some young plants.

Vulgarly known in those mountains and at Lima by the name of *Star-reed* and *Contrayerva de Bejuco*.

*Observ.*—The stalks, resembling cords when stripped of the bark, are used by the Indians for making thick ropes, and for forming traces and hand-rails to bridges; they also tie and interlace the posts and beams of their dwellings with these stalks, called by those tribes *bejuco*s, in common with every climbing or voluble plant, though they are each distinguished by some appellative name.

#### EXPLANATION OF THE PLATE.

1. Root. 2. Transverse section of the base of the stems. 3. Centre of the stem stripped of its bark. 4. Branch. 5. Flowers. 6. Flower longitudinally cut. 7. Stamens and pistil. 8. Capsule closed.



ARISTOLOCHIA *fragrantissima*.





AN ACCOUNT OF  
VALERIANA JATAMANSI,  
THE SPIKENARD OF THE ANCIENTS.

---

IT has long been a desideratum among the moderns, to know to what order and genus the plant belongs, which produced the Spikenard of the ancients. We are indebted to that learned Orientalist, the late Sir William Jones, for having first pointed it out satisfactorily; although he confounded with it another species totally distinct; and from which he has taken his botanical description and figure. This mistake arose from his not having received perfect specimens himself; but trusting wholly to the account and drawing given him by a friend, who was entirely unversed in botany, and who therefore could not be well supposed to distinguish accurately two plants of the same genus. The *Jatamansi* or *Jatamangsi* belongs to the genus *Valeriana*, and resembles in several respects the Celtic Nard, *Valeriana Celtica* Linn. The plant is perennial and cæspitose. The roots are simple, perpendicular, from four to six inches long; the upper half is very thickly covered with the reticulated remains of past leaves, resembling the hair of an animal; the lower half is destitute of them,

but is furnished with many short fibres which link them together. Their thickness varies: at the top they are generally that of one's finger, but taper gradually towards the base, and altogether resemble the tail of some animals. The radical leaves are long, lanceolate, acute, nerved, somewhat coriaceous, very entire, slightly pubescent, of a lively green colour. The stalks are solitary, arising from the centre of the leaves, varying from four to six inches in height, although they sometimes attain a foot; they are erect, very simple, cylindrical, furnished always, whatever their height may be, with two pair of leaves, pubescent, especially towards the top and leaves. Stem leaves opposite, sessile, of nearly the same shape as the radical ones, but much shorter, especially the uppermost pair; at the base they unite into a short sheath. The flowers are purple, collected into a crowded terminal cluster. The smell of the roots is peculiar to the genus, but more especially to *Valeriana Celtica* and *officinalis*; that of the *Jatamansi* may, however, be considered as possessing the most agreeable of any. This smell, which to many would not, perhaps, prove grateful, has led some to doubt its being the Spikenard of the ancients. My learned friend Dr. Francis Hamilton, in his account of Nepal, has expressed some doubts on the subject; but he says, "As there can be no disputing about taste, I cannot take upon myself to say how far the encomiums bestowed on the Spikenard are applicable to this Valerian; and the native women, no doubt, consider the smell very agreeable, because most of such as can afford it, use oil impregnated with this root for perfuming their hair. All I can say is, that, if this root was the Spikenard of the Roman ladies, their lovers must have had a very different taste from the youth of modern Europe." Notwithstanding the objections that might be raised

against the *Jatamansi* on the ground that the perfume produced by its roots, would not prove, perhaps, so grateful to our modern ladies, yet to the ladies of ancient Rome it might have been highly grateful, as it is to those of Nepal at the present day. The late Sir William Jones, in two learned dissertations published in the second and fourth volumes of the Transactions of the Asiatic Society, of which he was the able president, has, indeed, so fully demonstrated, by so many proofs, that the *Valeriana Jatamansi* is identical with the Spikenard of the ancients, and this opinion is supported by so many concurring circumstances, that there can, I think, be no doubt now left on the subject.

The *Valeriana Hardwickii*, with which Sir William Jones confounded it, has short fleshy roots sending out numerous cylindrical fibres. The radical leaves are cordate on long petioles; those of the stem pinnate or ternate. The flowers panicled, triandrous. Filaments and throat of the corolla quite smooth. The stigma 3-lobed. In other respects it differs widely. The roots have a strong scent like those of the common Valerian, and, as we are informed by Dr. Wallich, in Roxburgh's *Flora Indica*, are used by the natives of Nepal for medical purposes. I have the satisfaction of presenting to the public a very accurate figure of the whole plant, taken from fine Nepalese specimens sent to me by my excellent friend Dr. Wallich, the worthy and indefatigable superintendant of the Calcutta Botanic Garden. I have, likewise, given in the plate a representation of the Spikenard root formerly sold in the London shops, which, after several years search, I was fortunate to meet with in the shop of the late Mr. Godfrey, chemist, in Southampton Street. It will be seen how exactly the two roots coincide. I shall now conclude



this short account, by adding a very accurate description of the plant by Mr. David Don, from his manuscript *Prodromus Floræ Nepalensis*, in which he has described the greatest part of the Nepal plants sent to me by my friend Dr. Wallich.

---

### TRIANDRIA MONOGYNIA.

Ord. Nat. *Valerianæ*.

*VALERIANA De Cand.*

*Valerianæ Species. Linn.*

1. *V. Jatamansi*, floribus fasciculatis tetrandris, corollæ fauce barbatâ, ovariis tomentosis. stigmate simplici capitato, foliis lanceolatis acutis integerrimis pubescentibus; radicalibus petiolatis; caulinis sessilibus. *D. Don, Mss.*

*V. Jatamansi*, Jones in *Act. Soc. Asiat.* 2. p. 405, et 4. p. 109. *Roxb. ibid.* 451. *V. Spica*, Vahl. *Enum.* 1. p. 13, (exclus. descriptionibus omnino, quæ potiùs ad *V. Hardwickii* spectant.)

*Habitat*—in Bootaniæ et Nepaliæ Alpibus. 2. (V. S.)

*Planta perennis, cæspitosa*—Radices fusiformes, longæ, crassitudine variantes, sæpiùs ferè digiti; parte superiore rudimentis retiformibus foliorum emarcidorum densissimè tectâ; inferiore fibris brevibus instructâ: figura omnino ad caudas aliquorum animalium spectans. *Caules* erecti, simplicissimi, cylindracei, fistulosi, pube brevi juxta folia et versus apicem densiore undique suppediti. *Folia* radicalia plerumque elongato-lanceolata, rarissimè ellip-







*Valeriana Jatamansi.*

tica, acuta, integerrima, coriacea, 5-6-nervia, basi in petiolum attenuata, utrinque sub oculis armatis levitèr pubescentia; caulina sessilia, opposita: basi in vaginam brevissimam juncta; ima radicalibus conformia; suprema multò breviora sæpissimè ovata. *Flores* terminales, conglomerati, purpurei. *Pedicelli* ovariisque tomentosi. *Dentes* calycis brevissimi, triangulares, hirsuti. *Corollæ* tubo ampliato: limbo inæquali, 5-lobo: fauce villis clauso. *Stamina* 4, exserta; filamenta barbata. *Stylus* iis longior. *Stigma* simplex capitatum. *Pappus* brevis, facilè caducus. *D. Don, Mss.*

---



---

EXPLANATION OF THE PLATE.

---



---

1. Whole plant, natural size.
2. A specimen of the Spikenard root formerly sold in the London shops.
3. Corolla magnified, shewing the stamens.
4. Calyx with the pistil; beneath are the bracteoid scales.

---

THE END.

---



5314

**NOTIZIE**  
**SULLA**  
**NUOVA CHINA**  
**DI**  
**PITATO**



**ROMA**  
**TIPOGRAFIA DELLE BELLE ARTI**  
**1858**

*Con approvazione*

*G. Ricciardi*



SOPRA UNA NUOVA SPECIE DI CHINA-CHINA DENOMINATA PITAYA.

LETTERA DEL SIG. DOTT. G. FOLCHI PROF. DI MATERIA MEDICA,

AL CHIARISSIMO SIG. PROFESSORE DE MATTHAEIS.

A vendo la Santità di Nostro Signore GREGORIO PAPA XVI ricevuto in dono dalla repubblica della N. Granata una certa quantità di china-china con la denominazione di Pitaya, che colà si tiene in gran pregio, e si preferisce ad altre specie nella cura delle febbri intermittenti, Ella è stata sollecita a ricercarne a Sua Esn̄a Ruña il sig. Cardinal Bernetti un saggio tanto da riporsi nel gabinetto di Matcria Medica della Università, che da esplorarsi con l'analisi chimica, onde verificare se l'efficacia di questa specie era dovuta agli alcaloidi già conosciuti, ovvero ad altra nuova sostanza. Essendosi degnata la Santità Sua di favorire per mezzo del lodato Porporato il saggio richiesto, Ella gentilmente ne ha esibito porzione a me invitandomi a darne la descrizione, ed altra al comune collega sig. prof. Peretti, eccitandolo ad esaminarla chimicamente. Era in conseguenza ben convenevole che io dirigessi a lei le poche mie osservazioni, le quali per buona ventura è piaciuto al sig. Peretti impinguare con le importanti risultanze delle sue indagini, volendo unirsi meco nel darle un attestato di gratitudine e di ossequio.

M'incresce pertanto non poterle somministrare per mia parte che scarse e incerte notizie intorno la provenienza di questa corteccia, non facendone menzione che tre autori soltanto, per quanto è a mia cognizione. Il sig. professor Brera nel suo *Desideratum* l'appella *pitoya-china*, e dice essere provenuta l'anno 1817 da Guayaquil a Liverpool sotto il nome di china *peruviana*, e diffusa da Amburgo per la Germania con tale denominazione, ed anche con quella di china *nuova*. Aggiunge che alcuni l'hanno confusa con la china Tecamez e Bicolorata; ma tali essere le differenze fisico-chimiche tra queste cortecce, che non è possibile ridurle alla stessa specie. Difatto io che tengo sott'occhio tutte tre le mentovate cortecce del gabinetto, posso assicurare che se la pitaya diversifica nei caratteri dalla tecamez, con la bicolorata poi non ha la più lontana somiglianza. Il sig. Batka di Praga in una interessante memoria presentata all'accademia reale di medicina di Parigi nomina sempli-



cemente la pitaya, annunziando che un tal nome suol darsi in Inghilterra alla china bicolore. Ed ecco ripetuto lo stesso errore poc'anzi notato. Quegli che parla un poco più a lungo della pitaya è il sig. Guibourt, il quale nella seconda edizione della sua Istoria delle droghe semplici vol. I. pag. 456 narra che una scorza con questa denominazione è stata ricevuta dalla Colombia dal sig. De Londe, avente i tali caratteri, che egli brevemente descrive. Soggiunge poi che il sig. Henry figlio avendola analizzata, vi ha trovato tanto di chinina e cinchonina, che basterebbe per collocare la nuova scorza a lato delle vere chine, se da queste non la separassero i caratteri fisici. Havvi però tutta la ragione di dubitare che la scorza di cui parla Guibourt sia identica con quella, di che intendo io parlare, sì perchè i caratteri fisici di ambedue non sono intieramente d'accordo, come ancora perchè nella nostra non si sono manifestati all'analisi gli alcaloidi proprj delle vere chine. Queste sono le sole notizie che ho potuto procurarmi intorno la Pitaya, le quali, com' Ella ben vede, poco o nulla ci tolgono di oscurità, avendo inutilmente consultato la preziosa Memoria di Humbolt sulle chine inserita nel magazzino di Berlino, il *Podromus* di de Candolle, il *Systema vegetabilium* di Roemer e Schultes, la Monografia di de Bergen, e parecchie opere di Farmacologia e Materia Medica, delle quali poteva disporre.

Le qualità fisiche dell'esemplare, che per di lei mezzo ho avuto, sono le seguenti. I pezzi più grandi sono per metà ripiegati in se stessi, i minori con i margini approssimati a guisa di cannelli; i primi della lunghezza oltre un piede, del diametro oltre un pollice, e della grossezza di una linea e mezzo. La crosta esteriore formata dall'epidermide e dallo stratto cellulare è variabile nei diversi pezzi; in alcuni, particolarmente nei più grandi si osserva un velamento bianco, logorato in gran parte dall'attrito, simile al velamento perlaceo delle chine di Cartagena; in altri la crosta suddetta è alquanto fungosa, tubercolosa, ineguale, leggermente screpolata, in qualche punto divisibile in lamelle, ed ha un colore cinerizio sporco, talvolta con tracce del velamento perlaceo, ed offre più addentro un color giallo rossastro. Il libro, o lo strato fibroso è composto di fibre minute, stipate, di colore aranciato rossastro, più cupo nella faccia interna della corteccia. La frattura ineguale, poco fibrosa, e in essa appariscono le fibre quasi disposte in strati. Il sapore amaro persistente sgradevole. Qualche raro lichene foliaceo si scorge nella esterna superficie.

Il luogo nativo dell'albero, donde è stata tolta questa corteccia, è nei monti Pitayo della Nuova Granata. Il genere e la specie, cui il detto albero appartiene, sono ancora indeterminati. Essendo priva la scorza di chinina e cinchonina, giusta le indagini del sig. prof. Peretti, delle quali tra poco le darò contezza, pare non possa riportarsi la pianta al genere *Cinchona*, specialmente

dopo le recenti separazioni fatte da cotesto genere dal sig. De Candolle di molte piante, che male a proposito erano state da altri in esse comprese. I sigg. Brera e Guibourt sono di avviso appartenere probabilmente la pitaya al genere *Exostemma*; ed il secondo così la pensa vedendo una grande somiglianza tra le voci *Pitaya* e *Pitan* che è appunto la volgare denominazione di una specie di *Exostemma*, vale a dire l'*Exostemma floribundum*, chinachina piton, o di s. Lucia descritta per la prima volta da Badier nel 1798. Io non ho che una sola ragione da opporre a questa supposizione del sig. Guibourt, e mi sembra non del tutto spregevole. Negli alberi producenti le chine vere o false noi osserviamo una certa regolarità e costanza rispetto al luogo nativo. Così per addurne qualche esempio, sappiamo i generi *Luculia*, e *Hymenodiction* essere proprj dell'India orientale, il *Danais* nascere nelle isole dell'Africa australe, il *Pinkenusa* vegetare nella Carolina, e Georgia, il *Remija* al Brasile, e così vada dicendo della geografica distribuzione degli altri. Ora il genere *Exostemma*, e particolarmente la prima sezione *Pitonina*, nella quale sono rinchiusi i veri esostemmi è proprio delle Antille, regione ben diversa da quella, donde con certezza sappiamo provenire la nostra pitaya. Spetterebbe ella mai al genere *Buena*? Io per verità inclino molto a crederlo pensando che questo, come altresì il genere *cinchona* sono stati ritrovati quasi costantemente nelle ande del Perù, e della Nuova Granata, patria questa della pitaya, e sinora non si conosce che una sola eccezione, e cade sopra la *buena hexandra*, o china di Rio Janeiro, che ha per patria il Brasile. È inutile che io le faccia avvertire essere il genere *buena* quello stesso che Ruitz e Pavon autori della Flora del Perù avevan detto *Cosmibuena* rinuendo il pronome e nome di Cosimo Bueno, cui avean dedicato il nuovo genere. Pohl, al quale non è piaciuta cotesta composizione di parole, ha soppresso il pronome, ed è stato seguito da altri bottanici.

Ora per darle breve contezza delle indagini fatte dal sig. Peretti sopra i componenti della pitaya, dirò che questo valente chimico da principio ha saggiata una piccola quantità di detta scorza, e poscia ha ripetuto e variato le sue operazioni sopra una dose maggiore. Nel primo saggio egli ha diretto subito le sue ricerche a rintracciare gli alcaloidi comuni alle chine vere seguendo il consueto procedimento, che è quanto dire facendo bollire la scorza entro l'acqua acidulata, precipitando il liquido coll'ammoniaca, e col carbonato di potassa, raccogliendo e disseccando il precipitato, e trattandolo infine coll'alcool, cui è stato aggiunto anche un poco di acido solforico, onde ottenere l'alcaloide, di cui si andava in traccia, nello stato di solfato. Malgrado tutta la diligenza posta nell'esaminare le materie, egli non ha potuto rinvenire nè chinina nè cinchonina: la qual risultanza merita di essere notata, siccome contraria a quel-

la avuta dal sig. Henry, e capace di dare un qualche lume sul genere della pianta, d'onde è svelta la china pitaya. Nel tempo però che la ricerca per questo lato è andata a vuoto, è stata dall'altro canto di profitto, in quanto che per essa si è conosciuto 1. che il precipitato ottenuto dal decotto acido mediante l'ammoniaca contiene una *sostanza amara particolare* unita al tannino; 2. che una porzione di detta sostanza si depone dall'alcool nel tempo dello svaporamento, altra è ritenuta in soluzione; 3. che il medesimo precipitato racchiude le due materie coloranti *solida e falsa* così denominata dal sig. Peretti, e son quelle che ricusano di sciogliersi nello spirito di vino; 4. che il carbone animale, il quale si adopera per chiarificare la soluzione alcoolica, s'impadronisce della materia resinosa della corteccia, e di una parte della sostanza amara; 5. che se il precipitato ottenuto per mezzo del carbonato di potassa si tratti coll'etere, svaporando questo, si ha la sostanza amara in forma di aghetti cristallini, che sciolti nell'acido acetico rendono il liquido amarissimo; 6. che il decotto nell'acqua semplice di china pitaya s'intorbidisce col raffreddamento, cangia debolmente in rosso la carta tinta di tornasole, precipita a coagulo la gelatina animale, in grigio il persolfato di ferro, e somministra anco un sedimento col carbonato di potassa ed ossalato di ammoniaca, 7. infine facendo pria bollire la corteccia nell'acqua semplice, e poi nell'acqua mista ad un poco di acido idroclorico, e precipitando l'uno e l'altro decotto coll'ammoniaca, se i precipitati si trattino coll'etere, e si volatilizzi il solvente, si ha la sostanza amara in forma cristallina, e questo a giudizio del sig. Peretti è forse il più compendioso e spedito mezzo, onde procacciarsela.

Premesso questo saggio, ha il lodato chimico operato sopra una dose maggiore di pitaya, ed ecco in breve la serie delle operazioni da lui istituite. Ha fatto bollire sei oncie di corteccia nell'acqua stillata, ed ha ridotto la bollitura in estratto che avea il peso di oncie due; trattando questo nell'alcool a 34° una porzione si è sciolta, ed è stata posta in disparte; l'altra non sciolta ha offerto i caratteri della gomma, e del gallato di calce. Alla soluzione alcoolica è stato aggiunto un poco di acqua, cosicchè distillata ha lasciato un residuo acquoso, il quale tingeva in rosso la carta cerulea, precipitava a coagulo la gelatina animale, inverdiva col solfato di ferro, ed avea un sapore amarissimo ed astringente. Coteste qualità già dinotavano abbastanza contenere del tannino con eccesso di acido gallico, la sostanza amara, e la parte colorante. Ciò non pertanto è stata precipitata la soluzione coll'ammoniaca, e porzione del sedimento bianco giallastro trattata coll'etere, ha dato per mezzo dell'evaporazione il tannato della sostanza amara, o del nuovo alcaloide, lasciando indietro la materia colorante falsa.

Il rimanente del sedimento bianco giallastro è stato posto in contatto dell'acqua bollente, ed una parte si è sciolta; dell'altra dirò tra poco. Nella soluzione acquosa è stato infuso alquanto di acido solforico, chiarificato il liquido col carbone animale, quindi aggiunto un poco di carbonato di calce, onde togliere l'eccesso dell'acido, e portato lo svaporamento a siccità: il residuo è stato sciolto nell'alcool, e coll'evaporazione di questo si è avuto il solfato del nuovo alcaloide sotto l'apparenza di aghetti cristallini disposti a ventaglio.

La parte del sedimento non sciolta nell'acqua bollente è stata cimentata coll'idrato di potassa, ed ha formato un liquido di un rosso rubino: ripresa la potassa con un acido, si sono deposte le due materie coloranti solida e falsa.

Essendosi avveduto il sig. Peretti che il carbone animale gode della proprietà di assorbire e ritenere alcune delle sostanze, cui è destinato a depurare, e sospettando che nell'operazione poc'anzi esposta avesse tratto a se porzione del solfato dell'alcaloide, giacchè di questo erasi ottenuta ben piccola quantità, lo ha trattato dapprima coll'alcool bollente semplice, e così ha potuto ricuperare alquanto di solfato; considerando poi che la parte colorante, sulla quale il carbone esercita la maggiore affinità, fosse d'impedimento, onde l'alcool traesse fuori dal medesimo tutto l'alcaloide, vi ha fatto agire l'alcool bollente coll'aggiunta dell'idrato di potassa. In tal modo egli ha avuto un liquido amarissimo del colore di smeraldo, che si è mutato in giallognolo, ripresa la potassa mediante l'acido solforico. Quindi svaporato lo spirito di vino, trattato il residuo coll'etere, ed allungata la soluzione eterea coll'acqua stillata, ho ottenuto la maggior parte del nuovo alcaloide, che serbava appena qualche porzioncella della materia colorante. E questo è stato il caso, in cui si è manifestata la sostanza amara alcaloidea nella dose più significante.

Si è detto che la corteccia di pitaya nel peso di oncie sei era stata bollita nell'acqua semplice, e la bollitura ridotta ad estratto, sul quale sono state eseguite le esposte operazioni. Resta a dire che la medesima scorza si è fatta di nuovo bollire nell'acqua unita all'acido ossalico: infusa nel decotto l'ammoniaca si è avuto un precipitato rosso giallastro: 50 grani di questo trattati coll'etere han dato un liquido amarissimo colorato in giallo, e volatilizzato l'etere, è rimasto un residuo granulare composto di molta materia colorante solida, di un poco di acido gallico, e della sostanza amara. La combinazione della sostanza amara col tannino osserva il sig. Peretti non essere nuova nella chimica organica, poichè in questo stato si offrono la salicina nella corteccia del salcio, la chinina e cinchonina nelle chine vere ec.: nè la suddetta combinazione può richiamarsi in dubbio, mentre oltre le altre prove, se l'estratto alcoolico della pitaya si scioglie nell'acqua stillata, si chiarifichi il liquido col carbone animale, e svaporato si tratti il residuo collo spirito di vino freddo, si

avrà una tenue quantità dell'alcaloide combinato coll'acido idroclorico, proveniente forsi dal carbone preparato, e la parte non disciolta dallo spirito sarà gallato di calce; ma se il carbone adoperato in questo cemento si lavi ben bene nell'alcool avente in soluzione l'idrato di potassa, se ne potrà ricavare tutto l'alcaloide congiunto al tannino.

In forza di questi esperimenti si crede il sig. Peretti autorizzato a conchiudere la china pitaya contenere.

Una sostanza amara d'indole alcaloidea.

Due sostanze coloranti unite all'acido gallico che formano il rosso cinconico de' chimici francesi.

Gallato di calce.

Gomma.

Resina.

Parte fibrosa.

I caratteri del nuovo alcaloide, che rispetto alla sua provenienza potrebbe nomarsi *pitayna*, sono principalmente il non avere notabile amarezza nello stato solido e puro, il qual carattere egli appalesa, quante volte si sciolgano nell'acqua o nell'alcool o nell'etere i sali cristallizzabili e solubili, che forma cogli acidi; amara è pure la soluzione dell'alcaloide semplice nell'etere e nell'alcool, nei quali liquidi è solubilissimo, e d'onde può aversi in istato cristallino. Si fonde ad una temperatura eccedente i 400°, e tramanda dapprima vapori amarissimi, i quali raccolti si condensano in esilissimi prismi, poscia esala vapori empireumatici, che incontrando una carta tinta di curcuma la arrossano. Si scompone per l'azione dell'acido nitrico caldo e concentrato. Si combina coll'acido solforico nella ragione di 96 parti dell'alcaloide e 4 di acido e forma un sale bianco amaro in prismetti divergenti a guisa di un ventaglio. Coll'acido acetico compone un sale amaro inetto a cristallizzare.

Il sig. Berzelius nel tomo VI. pag. 223 del Trattato di chimica fa menzione di una scorza proveniente dalla Colombia, ed annoverata fra le chine: essa però si distingue dalla nostra pitaya, in quanto che racchiude la chinina e cinconina, giusta il saggio analitico istituito dal sig. Kuhlman. Sembrami piuttosto avvicinarsi alla nostra nella composizione chimica un'altra scorza, della quale fa egualmente parola il sig. Berzelius nel vol. citato alla pag. 222, sotto la denominazione di *china nova*, tanto più che a detto del sig. Brera la stessa denominazione è stata in Germania ed altrove tribuita alla pitaya. I sigg. Pelletier e Caventon che l'hanno analizzata, ne hanno estratto del sevo, una sostanza resinosa rossa, tannino, una materia colorante gialla, gomma, amido, acido chinovico, ed hanno avuto indizj di un alcali vegetabile, che il sig. Gruner riguarda come una base particolare. Comunque sia, io tengo per fermo che me-

glio assai delle chimiche investigazioni possa provare il valore di una nuova specie di china l'esperimento medico, particolarmente nel nostro cielo, dove per la indocilità delle intermittenti han fallito parecchi febbrifughi che altrove godevano di molta celebrità. E niuno certamente più di lei è al caso di far la prova al letto degli infermi, essendo uno dei Professori della nostra Clinica medica, e già autore de' primi esperimenti fatti nel medesimo Istituto sopra il solfato di china, l'emetinina, la morfina ec., de' quali Ella ha renduto conto in una Lettera inserita nelle *Effemeridi* di Roma.



DI ALCUNI ESPERIMENTI FATTI CON UNA NUOVA CHINA, NELLE SALE DI  
MEDICINA IN ROMA. RELAZIONE DIRETTA NEL 1835 DAL PROFESSORE  
GIUSEPPE DE MATTHAEIS, A SUA EMINENZA REVERENDISSIMA IL SIGNOR  
CARDINALE TOMMASO BERNETTI SEGRETARIO DI STATO DI SUA SANTITÀ'.

#### EMINENTISSIMO PRINCIPE

La filantropica sollecitudine, colla quale V. Em. degnossi di soddisfare alle mie brame, provvedendomi di una sufficiente quantità della nuova *china di Pitajo*, onde sperimentarla nelle sale cliniche, m'impone ora l'onorevole incarico di presentarle per le stampe il risultamento delle esperienze mediche praticate. E primieramente lode e grazie infinite sieno rese alla paterna bontà del Sovrano Pontefice GREGORIO XVI dato in vero dalla provvidenza a beneficio degli uomini. Imperocchè richiestone appena, volle esser largo e saggio dispensatore del dono di quella corteccia, inviatagli dal governo americano della Nuova Granata, destinandone per mezzo dell' Em. Vostra alcune libbre ad uso delle sale cliniche, dopo di averne somministrato al gabinetto di materia medica dell'archiginnasio, ed anche all'analisi chimica per farne meglio conoscere la composizione e la natura. Uso veramente nobilissimo e salutare, che giovando ai progressi della scienza, non meno che ai bisogni della umanità, onora l'ottimo principe con ciò che havvi di più onorevole, qual'è la pubblica utilità. La lettera interessante a me diretta dal ch. mio collega sig. dott. Folchi professore di materia medica ( *giornale arcad.* di Roma vol. 75 e 76, mesi di febb. e marzo 1833 pag. 429 a 439 ) espone con accuratezza la forma e i caratteri esterni di questa corteccia, oltre le molte notizie istoriche sulla mede-

sima, non meno che l'analisi chimica eseguitane dall'altro ch. professore di farmacia sig. Pietro Peretti. Confermasi da quest'analisi ciò che altri aveva annunziato da prima; la mancanza cioè della così detta *chinina* e *cinconina* in tale specie di nuova china, la quale invece di quei principii, presenta un novello alcaloide, in cui è da supporre assai probabilmente che risieda la virtù antifebrile della medesima, come nella chinina quella delle altre chine, e in altri alcaloidi quelle di molte altre sostanze medicinali, ex. gr. della morfina nell'opio; della emetina nella ipecacuana; della stricnina nella noce vomica ec. Per uniformarsi all'uso introdotto nella scienza è piaciuto di dare a questo nuovo alcaloide il nome di *Pitaina*, sostanza poco amara nel suo stato solido e puro, ma di grande amarezza tostochè salificata cogli acidi, scioglasi nell'acqua o nell'alcool, o restando fusa ad una temperatura superiore ai 400 gr. poichè tramanda in tal caso vapori amarissimi. Sarebbe stata in vero una doppia compiacenza per noi, se agli esperimenti antifebrili eseguiti colla nuova china in polvere avessimo potuto aggiungerne altri fatti colla *Pitaina*, e ottenerne effetti proporzionati, siccome è lecito di supporre. Ma questo nostro giusto desiderio non ha potuto esser soddisfatto sinora; giacchè dopo i molti esperimenti della corteccia ridotta in polvere, non ne rimase tanta copia da trarne coi reagenti chimici una bastante dose di *Pitaina* da potersi sperimentare anch'essa in modo concludente e sicuro. Dobbiamo intanto dichiarare, che la mancanza assoluta in questa nuova china della chinina e cinconina propria delle vere chine, e l'ignoranza, in cui siamo tuttora del genere e della specie, cui appartiene l'albero, donde deriva questa corteccia ( non conoscendosene per anche alcuna descrizione botanica ), rendono assai verisimile l'opinione di coloro, i quali credono che si debba annoverare piuttosto tra le false, che tra le vere chine. Qualunque però siasi il vero genere, e la vera specie botanica della corteccia del *Pitajo*, noi per gli effetti salutari, che ne abbiamo sperimentati nelle sale cliniche dell'università, non possiamo dubitare in alcun modo dell'eminente virtù febrifuga, che la distingue.

La straordinaria siccità della scorsa estate, prolungata a quasi tutto l'autunno, ha fatto sì che le febbri sieno state rarissime, e che pochi infermi di tal malattia si sieno veduti, contro il solito, negli ospedali di Roma. Questa felice e provida penuria di febricitanti non ha diminuito, ma ha ritardato di alcuni giorni il giusto numero dei nostri pubblici esperimenti. In estate, e precisamente dal fine di giugno al principio di agosto, 14 infermi tra uomini e donne sono stati sottoposti all'uso della nuova china. Le loro febbri, quantunque tutte manifestamente periodiche ed intermittenti, furono di vario tipo, e diverse anche per qualità e per circostanze. Ve ne furono con tipo di terzana, e con quello



di quartana; non ne mancarono delle *perniciose*, essendovene state due coleriche, alcune sviluppate di recente, ed altre inveterate, e poi riprodotte in quei giorni. Quasi mai per dissiparle noi non fummo obbligati a oltrepassare la dose di due oncie e mezzo della nuova china, divisa in 6 cartine per oncia, ed amministrata con proporzionati intervalli di tempo nelle ore d'intermissione. In una sola quartana la dose fu portata a 2 oncie più due terzi, senza mai arrivare in alcun caso alle 3 oncie. Imperocchè due sole oncie sono state quasi sempre sufficienti alla guarigione, e qualche volta anche meno. Due solamente di queste periodiche furono di prima esplosione, vale a dire suscitate allora per la prima volta: giacchè tutte le altre erano riprodotte in corpi, che le avevano sofferte altre volte, o nello stesso anno, o antecedentemente. In somma due libbre e mezzo della china pitaya furono consumate con felice successo nella cura delle febbri d'estate, volendone noi riserbare una dose anche maggiore per l'autunno, stagione tanto più amica delle medesime febbri, che rende assai più ostinate e più gravi a giudizio dello stesso volgo. Quindi all'incominciare di novembre tornammo ai medesimi esperimenti, e in tutto quel mese fino alla metà di dicembre furono trattati colla nuova china altri 46 infermi con febbri periodiche di diverso tipo, 4 delle quali con quello di quartana, e quasi tutte accompagnate da ostruzioni di fegato e di milza, soliti effetti dei ripetuti accessi delle medesime febbri, che con siffatte associazioni sogliono essere tanto più pertinaci e ribelli. Ciò non ostante amministrata la nuova china collo stesso metodo, e nelle medesime dosi, si sono sempre ottenuti i medesimi felici risultamenti: poichè dopo l'uso di 2 oncie di tal corteccia sottilmente polverizzata, alcune volte con qualche dramma di più, ed altre volte anche meno, i diversi febbricitanti uscirono tutti guariti dalle sale cliniche, quale un poco più presto, quale un poco più tardi. E se vi rimasero qualche giorno di più, oltre il bisogno, ciò fu fatto per osservar meglio il corso della loro convalescenza, e meglio assicurarci della loro guarigione. Ciascuno conosce la pertinacia, e la difficile espulsione delle febbri quartane. Costituiscono esse uno degli obbrobri della medicina, poichè resistono spesso alle più copiose dosi della corteccia peruviana, e non di rado conviene attendere il loro fine più dal cambiamento della stagione, o della dimora, che dai medicinali. Ora 6 casi di quartana hanno avuto luogo tra le 30 febbri periodiche da noi combattute colla nuova china; e quantunque associate esse fossero, secondo il solito delle quartane, a profonde ostruzioni di milza, non hanno resistito in alcun caso alla virtù febbrifuga della *china pitaya* in discretissima dose. Imperocchè amministrata, secondo il nostro metodo, ripartitamente nei giorni d'accesso, non vi fu mai bisogno di giungere alla dose di 3 oncie: poco più di

un'oncia moderava già il parossismo, e poco più di un'altra oncia lo troncava affatto. Quindi bastavano ordinariamente a dissipare le più pertinaci tra le periodiche oncie  $2\frac{1}{2}$  di nuova china, quando per lo contrario se ne richiedono molte oncie della china comune, siccome è noto a tutti i medici: e non di raro senza effetto sufficiente, ancorchè unita ad altri medicamenti, che si tengono per coadjuvanti. Ora questa minor dose della *china pitaja* bastevole a fugar le febbri più ostinate, come le più pericolose, forma la più sicura prova della sua maggior virtù, e della sua più grande efficacia antifebbrile, coerentemente all'opinione che hanno di essa gli americani medesimi.

Ma se questa nuova china fosse posta in commercio, acquistando ben tosto la riputazione che merita, vi sarebbe molto a temere delle solite adulterazioni dei commercianti, che amano il proprio interesse più che l'altrui utilità. Nè tali frodi sarebbero sempre facili ad essere scoperte: e se hanno avuto luogo in molte altre specie di china fin dal primo loro apparire in Europa, tanto più vi sarebbe ragione di temerle ora nella più efficace ed utile, come la più atta a tentare l'avidità dei trafficanti. Narra l'istoria, che gli Ateniesi avevano stabilito un magistrato particolare, *i sicofantì*, che invigilava sulla coltura, sul commercio, e sulla esportazione dei fichi dall'Attica, de' quali erano essi oltremodo vogliosi. Ora sembrerebbe assai più ragionevole e giusto, che gli americani del Perù e della Nuova Granata stabilissero un magistrato particolare sopra gli alberi delle chine, di cui abbonda il loro paese. Dovrebbe esso invigilare sulla raccolta, e sulla estrazione delle cortecce, tenendo lontana ogni sorta di alterazione e di frode da un genere, che certamente è più prezioso ed utile dei fichi. Imperocchè costituisce il rimedio sicuro della più frequente malattia degli uomini, qual'è la febbre periodica, funesta qualche volta, e micidiale ancora sotto forma di *perniciosa*. Nè dovrebbero andar disgiunte dai regolamenti di America misure corrispondenti anche nei porti di Europa, onde sempre più garantire la sincerità delle varie cortecce di china.

Accolga, Eminentissimo Principe, coll'usata sua bontà questo attestato, benchè tenue, del nostro zelo e dell'immensa nostra gratitudine e venerazione. E si compiaccia inoltre di trovare l'opportunità di farlo accogliere con paterna clemenza dalla SANTITÀ' DI NOSTRO SIGNORE, che il cielo prosperi e conservi lungamente pel bene di Roma e della Chiesa.

Dell'Eminenza V. Rm̃a

Uño Dño Obbiño servitore

GIUSEPPE DE MATTHÆIS

P. P. di med. clinica nell'università di Roma.

LETTERA SULLA CHINA DI PITAYO DEL SIG. GIROLAMO TORRES. ALL'ONOREVOLE  
SIG. SEGRETARIO DI STATO NEL DIPARTIMENTO DELL'INTERNO E  
AFFARI ESTERI DELLA REPUBBLICA DELLA NUOVA GRANATA.

TRADUZIONE

Allorchè V. S. mi fece l'onore di comunicarmi per tradurle le osservazioni delle felici applicazioni terapeutiche e Analisi chimiche che si sono praticate in Roma dag'Illustri professori di Medicina e chimica, sulla china denominata di Pitayò che il supremo Governo aveva inviato a Sua Santità, e in vista della ben meritata celebrità che da alcuni anni ha acquistato questa preziosa corteccia in tutta l'America del Sud e in alcuni luoghi di Europa per le sue qualità eminentemente febbrifughe, superiori a quelle delle altre chine conosciute; determinai rettificare i concetti equivoci che hanno formato di essa alcuni savj, e i dubbi che vi sono sopra la specie botanica a cui appartenga.

Quantunque sia già alcun tempo da che io ho esaminato personalmente i suoi individui vivi che vegetano in un ampia zona sopra la catena centrale della Cordigliera degli Andì alla temperatura di 80/, a 120/, gradi; che gli aveva determinato botanicamente, e che non dubitava appartenessero alla tribù delle Rubiacee, e al genere delle Cinchone, ho rinnovato le mie osservazioni per descrivere la specie con più puntualità e certezza. All'effetto ho ottenuto per favore del sig. Dott. Emanuelle Maria Mosquera attuale Governatore della provincia di Popayan un gran numero di tronchi dei fiori, frutti e foglie che esso personalmente ha radunato de'suoi individui in piedi sopra il medesimo terreno del paese di Pitayò in cui più prosperano. Con la presenza dei rami meglio conservati, si è formato con tutta l'attenzione possibile ed esattezza necessaria il disegno che accompagno a V. S. delle sue foglie, fiore, e fruttificazione nelle sue dimensioni naturali, ed inoltre ho formato la seguente descrizione de'suoi caratteri generici e specifici.

Calice super persistente. Corolla monopetala, ad imbuto, limbo esteso di cinque lacinie tagliate fino all'inserzione dei stami. Stami filamentosì, cinque rinserrati e inserti dentro il tubo della Corolla. Capsule oblunghe e flottanti Pistillo con ovario inferiore, stilo semplice e stigma bilobato. Pericarpio, capsula polisperma di due cellette o vani, il di cui fendimento o apertura è val-

vare e septicida. Semi con ali membranose nel suo bordo, imbricate e collocate in due serie longitudinali, sopra un ricettacolo a colonna angolosa in ciascuna celletta, il di cui numero varia fino a 29. Endosperma corneo. Embrione retto o annulare. Caratteri specifici delle sue foglie oblunghe lanceolate, acute, strette nella base, lisce, lucide. Pannicula dichotoma, ramosa, con due piccole foglie lineari opposte nella base di ciascun dicotoma. Calice campanulato con denti ovali acuti. Corolla color paonazzo biancastro, strisce lanceolate; felpate interiormente, e nell'esteriore coperta la corolla di un velo fino percettibile alla lente. Capsule oblunghe e proviste di coste. Le cortecce dei rami fiorenti hanno molte erepature areate profonde con i bordi prominenti come anelli che pajono false gole.

Nelle due chine officinali Pitayò si trovano le differenze seguenti: 1<sup>a</sup> che l'una di esse ha il legno molto più grave di quello dell'altra, secondo l'osservazione del dott. Cespedes professore di botanica in questa capitale. 2<sup>a</sup> che la corteccia dell'una si separa con più facilità dal tronco per essere secca e legnosa, di quella dell'altra che è più polputa: 3<sup>a</sup> che il petiolo e nervo principale delle foglie, nell'una è più rosso che nell'altre. 4<sup>a</sup> che i nervi laterali di alcune foglie formano un angolo meno acuto con il nervo principale in alcuni individui che in altri. 5<sup>a</sup> che una di esse manca della chinina e cinchonina, e solo ha un nuovo alcaloide che già lo ha osservato nella inviata a Roma il sig. Peretti, dove dice che l'altra possiede detti alcaloidi in maggior abbondanza che tutte le altre ehine officinali analizzate fino ad ora. Più, tanto l'una come l'altra china Pitayò possiedono le medesime qualità officinali: sono eminentemente febbrifughe, toniche etc., e si fanno di esse in medicina indistintamente tutte le applicazioni usate con egual successo; ma fino ad ora non si conosce, nè dalla struttura degli alberi, nè dalla loro fioritura, quali siano gl'individui nelle di cui cortecce esiste questa differenza, conosciuta dalla sua analisi chimica. Gli alberi peraltro dell'una e dell'altra china Pitayò hanno da quaranta a cinquanta piedi di altezza e da 18 a 20 pollici di grossezza: eguali nel loro abito esteriore, e nelle loro foglie, che alcune volte sono oblunghe, altre lanceolate, alcune cordonate dove terminano i rami fioriferi. La lunghezza ordinaria è di tre a quattro pollici, e la metà è la larghezza negli individui che già hanno il dovuto incremento; ma le foglie delle piante tenere hanno regolarmente il doppio di dette dimensioni. Nè tampoco si trova la più piccola differenza in alcuno degli organi della sua fioritura, che è assolutamente identica. Perchè si possano ripetere l'esperienze officinali e analisi chimiche ho fatto riunire alcune casse di corteccia di ehina di Pitayò con tutte le precauzioni che l'esperienza ha accreditato siano necessarie a fine di ottenerla di buona qualità.

Coi dati antecedenti credo non esisterà motivo per dubitare che la china Pitayò sia una vera cinchona officinale. L'ispezione sola del fiore, e la collocazione dei suoi organi sessuali, la escludono dal genere *exostema* del sig. Dott. Candelle, a cui hanno opinato che potrebbe appartenere i signori Brera e Imbourt, e molto meno che la china Pitayò sia la Piton di s. Lucia, come ha pensato il secondo, per la sola somiglianza delle voci senza pensare alla enorme distanza, diversa latitudine, distinta elevazione, e differente temperatura che vi è nelle regioni e luoghi nativi dell'una e dell'altra china. Nè tampoco si può confondere con la buona di Ruitz e Pavon, solo perchè quella di Pitayò, vegeti pure in un ramo degl'Andi della Nuova Granata come l'altra in quelli del Perù, altresì ad una immensa distanza di centinaia di leghe. Piuttosto parrebbe essere la china Pitayò quella di cui parla il sig. Barcelieux tom. 6° pag. 223, analizzata dal sig. Kuhlman, in cui trovò la chinina e cinchonina, come pure può esserlo la china nuova di cui parla il medesimo sig. Barcelieux al foglio 222 del medesimo volume, analizzata dai sig. Pelletier e Caventon che manca di ambi gli alcaloidi; dunque come si è detto, delle chine Pitayò le une lo hanno, le altre no, ancorchè ambedue appartengano indubitatamente al genere *Cinchona*, e quantunque l'azione tonica che l'una e l'altra esercitano sopra l'economia animale e nelle infermità intermittenti, sia egualmente energica. In fatti con ambedue si ottiene costantemente un successo favorevole nelle febbri intermittenti ribelli, che hanno resistito non poche volte alla corteccia del Perù e anzi al medesimo solfato di chinina pura e senza falsificazione. Nelle intermittenti perniciose chiamate *Larveas*, la china Pitayò è quasi l'unico mezzo fra noi di salvar la vita al paziente. Si amministra anche con gran successo nelle nervose periodiche. Come tonica si prescrive utilmente nelle affezioni *adinamiche*, e cancerose, emorragie con debolezza ec. ec. Piuttosto possono le chine Pitayò qualificarsi siccome varietà più energiche della cinchona lancifolia di Mutiz denominata *tunita* per la gran somiglianza che vi è fra esse.

Ma quantunque la china di buona qualità come quella Pitayò sia uno dei pochi specifici che conosce la medicina, e quantunque i professori l'applichino con opportunità e discernimento nei suoi casi, non otterrà il successo che si cerca, se essa non è stata raccolta e conservata con le precauzioni che l'esperienza ha manifestato essere necessarie per evitarne l'alterazione. Perde la sua efficacia la china ancorchè sia di superiore qualità, se estratta dall'albero le sue cortecce si lascino esposte per alcun tempo al sole e all'acqua. Si altera pure se subito che si estraggono le cortecce dagli alberi, si ammonitichino e rimanghino ammonitichiate per molto tempo ancorchè sia all'ombra, ed egualmente se non ostante che si spandino per diseccarle, si lascino sopra un

suolo umido e in un luogo senza ventilazione. Persino le cortecce di china già dissecate convenientemente perdono della loro qualità, quando si bagnino e non si asciugino con opportunità le casse in cui si trovino depositate. Ed anche la china polverizzata perde la sua virtù esposta per molto tempo all'impressione di una atmosfera calda e umida.

Credo che le indicazioni anteriori basteranno per dissipare l'incertezza che ha avuto luogo in Europa fino ad ora sopra la vera specie botanica a cui appartiene la china Pitayò, e che non vi sarà alcun motivo per dubitare che sia del genere cinchona tanto quella che possiede la chinina come quella che senza questa offre un nuovo alcaloide. Le molteplici applicazioni che da molti anni sono state fatte nell'America del Sud sempre con buon successo; quelle che già si sono praticate in Europa, e quelle che potranno adesso ripetersi in Roma con le chine che invio, confermeranno la sua giusta celebrità e assicureranno alla Nuova Granata questo prezioso articolo di Commercio, che in certo modo gli è esclusivo per le sue eminenti qualità; ma di niente gli servirebbe alla Repubblica che si stabilisse nei mercati di Europa la sua reputazione, se il Governo l'abbandonasse all'avarizia degli speculatori, poichè in poco tempo verrebbe a screditarsi come accadde prima colla *tunita* di Mutiz, e già si sta sperimentando anche col solfato di chinina di Francia a causa delle sue diverse falsificazioni. Le conseguenze pregiudizievoli di simili frodi non ricadono ordinariamente sopra i primi infrantori della buona fede pubblica che ne cavano tutto il loro profitto, ma bensì su gli altri cittadini cui privano essi ingiustamente degli ulteriori vantaggi della speculazione; pel qual motivo è attribuzione del Governo prevenire tali abusi nocivi alla prosperità del commercio, che alimenta quella dello stato.

Se V. S. trovasse giovevoli allo scoppo queste osservazioni, contribuirà ad evitare nel tratto successivo quelle frodi degnandosi al medesimo tempo trasmetterle per mezzo dell'Incaricato d'affari presso Sua Santità ai professori che si sono occupati in Roma delle applicazioni e analisi della china Pitayò.

Dio guardi V. S. GIROLAMO TORRES.

È traduzione letterale

FERDINANDO LORENZANA

*Incaricato d'affari interino della Nuova Granata  
presso la S. Sede.*

*Pitayo Cinchona Lanceifolia*







*Notices*  
*sur le nouveau Quina*  
*de Pitayo.*



5314

*Notices sur le nouveau Quina  
de Pitayo.*

---

Sur une nouvelle espèce de Quinquina, appelée  
Pitaya — Lettre de Mr. le Docteur G. Solchi, Professeur  
de matière médicale, à l'illustre Professeur, Mr. de  
Mattbaeis.

---



La sainteté notre Chiqueur le Pape Grégoire  
ayant reçu en présent de la république de la nouvelle Espagne  
une certaine quantité de Quinquina, pour la dénomination  
de Pitaya, qui est très estimé dans le pays, et en préférence  
aux autres espèces, dans le traitement des fièvres intermittentes,  
vous nous êtes envoyé l'un de ces à son Excellence le Cardinal  
Bernetti, un échantillon, tant pour le placer dans le Cabinet  
de Matière Médicale de l'Université, que pour l'examiner par  
l'analyse chimique, afin de vérifier si l'efficacité de cette espèce  
était due aux alcaloïdes déjà connus, ou à une autre substance  
nouvelle. La sainteté ayant daigné envoyer l'échantillon demandé,  
par l'entremise de l'illustre Cardinal, nous avons eu la bonté de  
vous en offrir une portion, en vous invitant à en donner la description,  
et me faire à notre Collègue Mr. le Professeur Peretti, l'engager  
à l'analyser chimiquement. Il convenait dès lors que je vous  
adressasse mes observations, peu nombreuses, qui par vous vous se

dont augmentées des importants résultats des recherches de M.  
Peretti, qui s'est empressé de s'unir à moi pour me donner en  
cela une preuve de reconnaissance et de respect.

Il m'est pénible cependant de ne pouvoir vous fournir pour  
ma part ~~de la quina~~ ~~vous fournir~~ que des renseignements en  
petit nombre et peu certains, relativement à la provenance de cette  
écorce, trois auteurs seulement en faisant mention, auteur qu'il en  
à ma connaissance. M. le Professeur Biera, dans son De Sidera <sup>l'inn</sup>  
l'appelle pitaya-china, et dit qu'elle est venue en 1817 de  
Guyaquil à Liverpool sur le nom de Quina du Pérou, et  
son régaland de Hambourg en Allemagne, sous cette dénomination,  
et aussi sous celle de Quina NOVA. Il ajoute que quelque-  
uns l'ont-elle fondue avec le Quina Becamez et Bicolora ; mais  
que les différences physico-chimiques entre ces trois écorces sont  
telles, qu'il n'est pas possible de les réduire à la même espèce.  
Au fait, pour moi qui ai soulevé avec les trois écorces dont  
il s'agit, je puis assurer que si le Quina Pitaya diffère dans  
sa caractéristique du Becamez, il n'a pas avec le Bicolore la plus  
petite ressemblance. M. Batka de Prague, dans un interpres-  
sion même présentée à l'Académie royale de médecine de Paris, nomme  
simplement le pitaya, annonçant que ce nom est ordinairement  
donné, en Angleterre, au Quina Bicolore, renouvelant ainsi l'erreur  
dont j'ai parlé plus haut. Celui qui parle un peu plus au long du  
Quina Pitaya, est M. Guiboust, qui, dans la seconde édition, et

Sur l'histoire du Droguer simple, Vol. 1. Page 486, raconte qu'une  
écorce ainsi dénommée a été reçue de la Colombie par Mr. De Londe;  
ayant tels caractères, dont il donne brièvement la Description. Il  
ajoute ensuite que Mr. Henry, fils, l'ayant analysé, y a trouvé  
après de quinine et de cinchonine, pour qu'on pût placer la  
nouvelle écorce à côté des vrais quinas, d'i les caractères, physiques  
ne lui séparant. Il y a cependant toute raison, de douter que  
l'écorce dont par le Guibourg, soit identique avec celle dont je  
me propose de parler, tant parce que les caractères physiques des  
deux écorces, ne cadrent pas entièrement, que parce que, dans la  
notre, l'analyse n'a pas fait reconnaître les alcaloïdes propres  
aux vrais Quinas. C'est pour <sup>les</sup> seuls renseignements que j'ai pu  
me procurer relativement au Pitaya, les quels, comme vous le  
voyez, ne nous apportent que peu ou point de lumière, ayant  
inutilement consulté le précieux mémoire de Humboldt sur les  
Quinas, inséré dans le Magazine de Berlin, le Prodromus  
de DeCandolle, le Systema vegetabilium de Rozmex et  
Schulter, la Monographie de de Wengen, et différents autres  
ouvrages de Pharmacie et de matière médicale dont j'ai pu  
disposer.

Les qualités physiques de l'échantillon, que j'ai eu par  
voies entières, sont les suivantes. Les morceaux les plus grands sont  
<sup>à moitié repliés sur eux-mêmes</sup> les plus petits avec les bords  
rapprochés comme des <sup>de la Gamelle</sup> ~~légères~~ <sup>de fruits</sup> ; les premiers de la longueur

de plus d'un pied, du diamètre de plus d'un pouce, et de la grosseur  
d'une lique et demie: dans quelques uns, particulièrement dans  
les plus grands, la croûte extérieure, formée par l'épiderme ou par  
le stratum cellu<sup>aux</sup>l<sup>aire</sup>, est variable dans le différent morceaux;  
dans quelques uns, particulièrement dans les plus grands, on  
apportoit une pellicule blanche, assez grande pour se frotter  
semblable à la pellicule perlée de Lima, de Cartaginé;  
dans d'autres, cette croûte est un peu spongieuse, tuberculeuse, inégale,  
légèrement fendillée, en quelque sorte pouvant se diviser à lamelle;  
elle a une couleur endurée sale, quelque fois avec de bruns de la  
pellicule perlée; et elle offre, plus à l'intérieur, une couleur jaune orangée  
ou libre, ou le stratum fibreux, est composé de fibres minces,  
serées, de couleur orangée rougeâtre, plus foncée dans la face  
interne de l'écorce. La <sup>face interne</sup> ~~face~~ est inégale, peu fibreuse, et laisse  
voir les fibres ~~presque~~ disposées par lits. La saveur amère est  
persistante, désagréable. On remarque à la superficie externe  
quelques <sup>rare</sup> lichens ~~laineux~~ foliacés.

La patrie de l'arbre d'où a été prise cette écorce est  
dans le mont Oraya de la Nouvelle Grenade. Le genre et  
l'espèce auxquels appartient cet arbre sont encore indéterminés.  
L'écorce ne contenant ni quinine ni cinchonine, d'après les  
recherches de Mr. le Professeur Peretti, dont je vous rendrai compte  
tout à l'heure, il semble que la plante ne parait pas pouvoir être  
reportée au genre Cinchona, surtout depuis les séparations récentes,



que faites par Mr. DeCandolle a fait et d'au ce genre, d'un grand  
nombre de plantes qui y avaient été mal a propos comprises  
par d'autres botanistes. M. M. Duran et Guibourt pensent que  
le pitaya appartient probablement au genre Exostema, et se-  
cond il l'a cru ainsi, en voyant une grande ressemblance entre  
les mots pitaya, et piton, qui est précisément la diminution,  
nalgue d'une espèce d'exostema, c'est à dire de l'Exostema  
floribunda, quinquina à piton, ou de St. Lucie, décrit pour  
la première fois par Barlier, en 1798. Je n'ai qu'une raison  
à opposer à cette supposition de Mr. Guibourt, et elle ne me  
semble pas tout à fait à dédaigner. D'au les arbres qui  
produisent les quinas vrais ou faux, on observe une sorte de  
régularité et de constance relativement au lieu où ils croissent. C'est,  
pour en donner un exemple, nous savons que les genres Luculia  
et hyemodictyon sont propres à l'Inde orientale, que le Dauria  
naît ~~est~~ d'au les, et de l'Afrique australe, que le Pinkueia  
croît d'au la Caroline et la Géorgie, et Remija au Brésil, et  
il s'en va ainsi de la distribution géographique des autres.  
Or le genre Exostema, et particulièrement la première section,  
pitonia, d'au la quelle sont renfermés les vrais exostemas est  
propre aux Antilles, contrée bien différente de celle d'au nous  
savons avec certitude que vient notre pitaya. Ce particulier  
il au genre Dura? Quant à moi, en vérité, je penche fort à  
le croire, confondant que ce genre, comme aussi le genre Cinchona

Je trouve presque constamment dans les Andes, du Pérou et de la nouvelle Grenade, où croit le pitaya, ce jus qu'à présent on ne connaît qu'une seule exception à cette règle, celle s'appliquant au buena heradura ou Quina de Rio Janeiro, qui a le Prîsît pour patrie. Il est inutile que je vous fasse remarquer que le genre buena est le même que Rutz et Baron, auteurs de la flore du Pérou, avaient appelé Cosmi buena, l'unique pour le prénom et le nom de Côme Buena, aux quels ils avaient dédié le nouveau genre. Pohl, qui n'a pas trouvé de son goût ce nom composé, a supprimé le prénom, et il a été imité par tous les autres botanistes.

Maintenant pour rendre compte <sup>rendre compte</sup> d'un peu de notre idée de recherche faite par Mr. Peretti sur la composition du Pitaya je vous dirai que cet habile chimiste a d'abord soumis à son expérience une petite quantité de l'écorce en question, et a ensuite répété et varié ses opérations sur une dose plus considérable. Dans le premier essai, il s'est attaché tout de suite à reconnaître la présence des alcaloïdes communs aux vrais Quinas, <sup>ou</sup> suivant le procédé habituel, c'est à dire en faisant bouillir l'écorce dans de l'eau acidulée, précipitant le liquide avec l'ammoniaque, et avec le carbonate de potasse, recueillant et faisant sécher le précipité, et le traitant enfin par l'alcool, au quel on ajoute au si un peu d'acide sulfurique, a fin d'obtenir l'alcaloïde qu'il cherchait, à l'état de sulfate. Malgré tout le soin

apporté à l'examen, de matière, il n'a pu retrouver ni quinine,  
ni cinchonine. Ce résultat mérite d'être noté, comme contraire  
à celui obtenu par Mr. Henry, et comme pouvant jeter quelque  
lumière sur le genre de la plante, d'où provient le pitaya. Mais  
tandis que ce sont ces <sup>rapports</sup> ~~faits~~ (constate la présence de l'alcaloïde)  
les recherches avaient donné un résultat négatif, soit m-  
autre elle, n'avaient pas été faites davantage, puisque elles avaient  
amené à connaître 1°. que le précipité obtenu par la décoction,  
de l'acide, au moyen de l'ammoniaque, contenait une substance  
amère particulière, combinée au tannin; 2°. qu'une portion de  
cette substance se dégage de l'alcool pendant l'évaporation,  
et que l'autre reste en solution; 3°. que le même précipité  
reformait les deux matières colorantes ~~et~~ <sup>major</sup> ~~et~~ <sup>faible</sup>, ainsi  
appelées par Mr. Perotti, et sont celles, qu'on ne peut dissoudre  
dans l'esprit de vin; 4°. que le carbone animal qu'on emploie pour  
clarifier la solution alcoolique, se rend maître de la matière  
résineuse de l'écorce, et d'une partie de la substance amère; 5°. que  
si le précipité obtenu par le moyen du carbonate de potasse se  
travaille par l'éther, quand on fait évaporer celui-ci, on a la  
substance amère en forme de petites aiguilles cristallines, qui,  
dissoute dans l'acide acétique, rendue le liquide très amer;  
6°. que la décoction du ~~chêne~~ quina pitaya dans l'eau simple  
devient trouble au refroidissant, change faiblement de rouge  
le papier teint de tournesol, précipité au la congelant la gélatine.

animale, précipité en gris le persulfate de fer,  
et <sup>produit encore un dépôt par</sup> ~~il fournit même un précipité~~ avec le carbonate de potasse  
et l'oxalate d'ammoniaque; 7<sup>e</sup> enfin, faire d'abord  
bouillir l'écorce dans de l'eau simple, et puis dans de l'eau  
mêlée à un peu d'acide hydrochlorique, et précipiter l'une et  
l'autre décoction, avec de l'ammoniaque, si on traite les  
précipités, par l'éther, et si on volatilise <sup>le</sup> dissolvant, on a la  
substance amère en forme cristalline, et c'est, au jugement de  
Mr. Beretti, peut-être le mûge, le plus abrégi et le plus expéditif  
de se la procurer.

Après avoir annulé par-at-estai, l'habile chimiste  
a opéré sur une plus grande quantité de pitaya, et voici, en  
peu de mots, la série des opérations aux quelles il s'est livré:  
Il a fait bouillir six onces d'écorce dans de l'eau distillée, et  
a réduit à l'état d'extrait, <sup>puis</sup> ~~puis~~ <sup>d'après</sup> ~~d'après~~ deux onces, qu'il  
a traité par l'alcool à 34°. Une partie s'en est dissoute, et a été  
mise à part; l'autre non dissoute a offert les caractères de la  
gomme et du gallate de chaux. À la solution alcoolique  
on a ajouté un peu d'eau; soumis à la distillation, on a eu  
un résidu aqueux qui teignait en rouge le papier bleu, précipitait  
à la congélation la gélatine animale, se dissolvait avec le sulfate  
de fer, et avait une saveur très amère et astringente. En qualité  
de notation déjà suffisamment que le résidu contenait du tannin  
avec excès d'acide gallique, la substance amère, et la partie

colorante. Néanmoins la solution a été précipitée par l'ammoniaque, et une partie du dépôt blanc jaunâtre, traité par l'éther, a donné, au moyen de l'évaporation, le tartrate de la substance amère ou du nouvel alcaloïde, laissant en dehors la matière colorante fauve.

Le reste du dépôt blanc jaunâtre a été mis en contact avec l'eau bouillante, et une partie s'est dissoute; je paralai de l'autre tout-à-l'heure. Quelque peu d'acide sulfurique a été versé dans la solution aqueuse, et le liquide a été clarifié avec le charbon animal, on a ensuite ajouté un peu de carbonate de chaux, pour atténuer l'excès d'acidité, et l'évaporation a été portée jusqu'à la siccité. Le résidu a été dissous dans l'alcool, et par suite de l'évaporation, on a obtenu le sulfate d'un nouvel alcaloïde, sous la forme de petites aiguilles cristallines disposées en ~~une~~ <sup>deux</sup> ~~aut~~ <sup>autres</sup> ~~aut~~ <sup>autres</sup>.

La partie du dépôt non dissoute dans l'eau bouillante a été essayée par l'hydrate de potasse, et s'est formée un liquide d'un rouge rubis. Le potasse ayant été reprise par un acide, lui deux matières colorantes, la vraie et la fautive, se sont précipitées.

M. Peretti s'étant aperçu que le charbon animal jouit de la propriété d'absorber et de retenir quelques matières subtiles qu'il est destiné à épurer, et soupçonnant que, dans l'opération dont je n'eus de rendre compte, il avait attiré à lui une portion d'acide sulfurique et d'alcaloïde, jusqu'où <sup>il en</sup> avait obtenu qu'une très

petite quantité, il l'a traité d'abord par l'eau bouillante simple, et ainsi il a pu récupérer un peu de sulfate; on finira ensuite que la partie colorante, sur laquelle le charbon exerce la plus grande influence, faisait obstacle à ce que l'alcool retirât du sulfate tout l'alcaloïde, il a employé l'alcool bouillant, avec addition de l'hydrate de potasse. De cette façon, il a obtenu un liquide très-amer de couleur d'émeraude, qui s'est changée en jaune pâle, la potasse ayant été reprise par l'acide sulfurique. Enfin ensuite, l'essence de résine ayant été évaporée, le résidu traité par l'éther, et la solution éthérée étendue d'eau distillée, il a obtenu la plus grande partie du nouvel alcaloïde, qui se composait à peine quelques petites portions de la matière colorante. Et c'est dans ce cas que la substance amère alcaloïde s'est montrée à dose plus forte.

On a vu que l'écorce du pitaya, au point de s'opier, avait été mise en ~~de~~ décoction dans l'eau simple, et la décoction réduite à l'état d'extrait, sur lequel a été formée une opération dont il n'est rien d'être rendu compte. Il reste à dire qu'on a, de nouveau fait bouillir la même écorce dans de l'eau mêlée d'acide oxalique, ayant ajouté de l'ammoniaque à la décoction, on a eu un précipité rouge jaunâtre : 50 grains de ce précipité, traité par l'éther, ou donné un liquide très-amer, coloré en jaune, et après la volatilisation de l'éther, il est resté un résidu grume composé de beaucoup de matière colorante noire, d'un peu d'acide gallique, et

de la substance amère. Mr. Peretti remarque que la combinaison  
de la substance amère avec le tannin n'est pas nouvelle dans  
la chimie organique, puisque la jaléine dans l'écorce du faule,  
la quinine et la cinchonine dans les quinas, <sup>etc.</sup> vrai, présentent  
ce phénomène. Et cette combinaison se saurait être mise en doute,  
attendu que, en outre des autres preuves, si l'on fait évaporer  
l'extrait alcoolique du pitaya dans l'eau distillée, qu'on  
clarifie le liquide avec le charbon animal, et que le résidu,  
évaporé, se traite par l'esprit de vin froid, on obtiendra une faible  
quantité de l'alcaloïde combiné avec l'acide-hydrochlorique,  
provenant peut-être du charbon préparé, et la portion non  
dissoute sera du gallate de chaux; mais si le charbon employé  
dans cette ~~essai~~ expérience est bien lavé dans l'alcool dans lequel  
on aura mis en dissolution l'acide d'hydrate de potasse, on en  
pourra retirer tout l'alcaloïde joint au tannin.

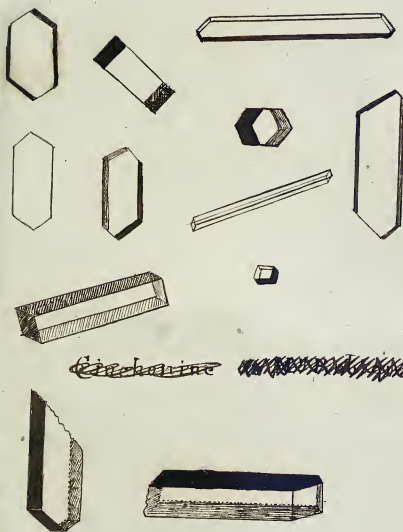
En conséquence de ces expériences, Mr. Peretti se croit  
autorisé à conclure que le pitaya contient :

- Une substance amère, de caractère alcaloïde,
- Deux substances colorantes mises à l'acide gallique, qui  
forment le rouge cinchonique des chimistes français,
- Du gallate de chaux,
- De la gomme,
- De la résine,
- Une partie fibreuse.



Le caractère du nouvel alcaloïde, qui, en raison de la source d'où il provient, pourrait s'appeler pitayne, dou-principalement de n'avoir pas une amertume notable à l'état solide et <sup>amertume</sup> ~~qui se fait remarquer~~ <sup>qui se fait remarquer</sup> développe ~~un caractère~~ <sup>spécifique</sup> tout-à-fait, qu'on fait dissoudre dans l'eau, ou dans l'alcool ou dans l'éther le sel, cristallisable et soluble qu'il forme avec les acides: cependant la solution de l'alcaloïde fume dans l'éther ou dans l'alcool, liquide dans lequel il est très soluble, et dont on peut l'obtenir à l'état cristallin, est amère. La pitayne se fond à une température excédant 100 degrés et répand d'abord des vapeurs très amères, qui se condensent en petites têtes d'héris, elle exhale ensuite des vapeurs empyreumatiques, qui rougissent un papier teint en arcumma. Elle se décompose par l'action de l'acide nitrique chaud et concentré. Elle se combine avec l'acide sulfurique, dans la proportion de 96 parties de l'alcaloïde contre 4 d'acide, et forme un sel blanc amer, un peu indurécible, à la manière d'un ~~sel~~ évulsiel. Avec l'acide acétique, il forme un sel amer, impropre à se cristalliser.

Mr. Berzelius, au Tome 6, page 229 de son Tracts de l'Amérique, fait mention d'une écorce provenant de la Colombie, et comptée parmi les quinas. Elle se diffère pourtant de notre pitayne en ce qu'elle contient la quinine et la cinchonine, ainsi que l'ont démontré les analyses analytiques faites par Mr. Kuhlmann. Une autre écorce dont Mr. Berzelius parle également dans le



Cinchonine cristallisée vue  
au Microscope,



dans le Vol. déjà cité, à la page 221, ne semblent plutôt se  
rapprocher de la nôtre, & pour la composition chimique; & l'on  
donne le nom de Quina novæ d'autant plus qu'en dire  
de Mr. Brera, la même dénomination a été, en Allemagne et  
ailleurs, appliquée au pitaya. M. Polletier à Carcassonne, qui  
l'a analysé, en ont extrait du suif, une substance résineuse rouge,  
du tannin, une matière colorante jaune, de la gomme, de l'amidon,  
de l'acide chinorique, et ont aperçu des indices d'un alcali  
végétal, etc. que Mr. Gruner regarde comme une base particulière.  
Quoi qu'il en soit, j'ai la certitude que toutes les investigations  
chimiques ne sauraient prouver l'efficacité d'une nouvelle espèce de  
quina aussi bien que l'expérimentation médicale; surtout dans  
notre climat, ou à cause de la réclitance des fièvres intermittentes,  
on n'a rien obtenu de plusieurs febrifuges qui ailleurs ont eu une  
grande réputation. Je peronne assurément plus que vous n'en en-  
position d'en faire utilement l'essai, tant comme Professeur de  
Clinique médicale, que comme auteur des premières expériences  
faites, dans vos cours, sur le sulfate de Quina, l'écéruine, la  
morphine, etc., expériences dont vous avez rendu compte dans  
une lettre insérée aux Ephémérides de Rome.

De Quelques expériences faites avec un  
nouveau Quina dans la Salle de médecine de Rome.  
— Rapport adressé en 1835 par le Professeur Joseph  
de Matthæis, à Son Em. Mr. le Cardinal Thomas  
Bernetti, Secrétaire d'Etat de Sa Sainteté!

Vra. Eminence Prince,

La sollicitude philanthropique avec laquelle vous avez daigné  
obtempérer à mon désir, en me faisant remettre une quantité suffisante  
du nouveau Quina de Pirago, pour en faire l'expérience dans la  
Salle Clinique, m'impose l'honorable devoir de vous faire connaître  
par la voie de l'impression, le résultat des expériences médicales  
pratiques. Et d'abord, qu'un tribut de <sup>actions de</sup> bonnegrâce et de <sup>grâces</sup>  
n'ait point payé à la bonté paternelle du Souverain Pontife  
Grégoire XVI, qui nous a été donné par la providence pour le  
bonheur du genre humain. Après lui en avoir je vous prie la demande,  
que dans sa générosité et sa sage libéralité, il a voulu nous admettre  
au partage du présent qu'il avait reçu du gouvernement américain de  
la nouvelle Grenade, en destinant par l'entremise de votre Em.,  
quelques livres à l'usage de la Salle Clinique, après en avoir  
fait parvenir au Cabinet de matière médicale de l'Archigynase  
et aussi y avoir fait aussi participer l'analyse chimique,  
afin d'en faire mieux connaître la composition et la nature. Usage  
mainment bien noble et bien salutaire, qui en servira aux progrès de

de la science, non moins qu'aux besoins de l'humanité, honore  
l'excellent prince par ce qu'il y a au monde de plus honorable,  
l'utilité publique. L'intéressante lettre qui m'a été adressée  
par mon collègue Mr. le Docteur Solchii, professeur de  
matière médicale (Journal académique de Rome, Vol. 75 et 76,  
mois de février et de Mars 1833, pages 129 à 139) se passe  
avec soin la forme et les caractères extérieurs de cette écorce,  
donnant en même temps plusieurs renseignements historiques à son  
sujet, et rendant compte de l'analyse chimique à laquelle elle  
a été soumise par Mr. le Professeur de pharmacie Perotti. Par  
cette analyse se trouve confirmé ce qu'il avait annoncé d'abord,  
à savoir l'absence de ce qu'on appelle quinine et cinchonine.  
D'autre cette espèce de nouveau quina, ~~la place~~<sup>qui</sup> au lieu de ~~la~~<sup>la</sup>  
principale, présente un nouvel alcaloïde, d'autre lequel on doit  
supposer avec assez de raison que réside la vertu antifebrile  
de cette écorce, comme réside dans la quinine celle des autres  
quinines, et d'autre d'autre alcaloïde, celle de beaucoup d'autres  
substances médicinales, ~~on~~<sup>on</sup> exempli gratia, de la morphine  
dans l'opium, de l'émétine dans l'ipécacuanha, de la stricnine  
dans la noix vomique, etc. Pour se conformer à l'usage  
introduit dans la science, on a jugé à propos de donner à ce  
nouvel alcaloïde le nom de Pitagna, substance peu amère  
dans son état solide et pur, mais d'une grande amertume,  
auparavant qu'elle a été réduite à l'état de sel, par le acide,

qu'on la fasse dissoudre dans l'eau ou dans l'alcool, on étend  
fondue à une température supérieure à 100 degrés, jusqu'à ce  
dégage<sup>alors</sup> des vapeurs très amères. C'est été une double satisfaction  
pour nous, si, aux expériences ~~exécutées~~ antipébriles exécutées  
avec le nouveau quina au poudre, nous eussions pu en ajouter  
d'autres faites avec la Pitana, et en obtenir des effets  
proportionnés, comme il est possible de le supposer. Mais  
notre juste dépit n'a pu être satisfait jusqu'à présent; et c'est  
qu'après les nombreuses expériences faites avec l'écorce réduite  
au poudre, il n'en est pas resté quantité suffisante pour qu'on  
pût en tirer avec le réactif chimique une dose de Pitana  
après considération pour être expérimentée d'une manière concluante  
et sûre. Nous devons en même temps déclarer que la boue  
totale, d'autre le nouveau quina, de la quinine et de la cinchonine,  
propre de vrai quina, et l'ignorance où nous sommes toujours,  
du genre et de l'espèce aux quels appartient l'arbre d'où provient  
cette écorce (n'en connaissant jusqu'à présent aucune description  
botanique) recule assez raisonnable l'opinion de ceux qui croient  
qu'on doive la compter plutôt parmi les faux que parmi les  
vrais quina. Quelle que soit pourtant le vrai genre et la  
vraie espèce botanique de l'écorce du Pitago, nous ne pouvons,  
nous, à raison des effets salutaires que nous en avons recueillis  
contre la fièvre éti que de l'indigène; nous ne pouvons donc  
en aucune manière de l'éminente vertu fébrifuge qui la distingue.



## quinidine

octaèdre rectangulaire

\_\_\_\_\_ rhomboïdal

prisme droit rectangulaire

\_\_\_\_\_ idem ~~polyèdre~~ terminé par un biseau

prisme droit rhomboidal

quelques fois prisme droit à base polyèdre carré

---

Monsieur

Monsieur

*Guérin*

Membre de l'Académie Nationale de Médecine,

Rue

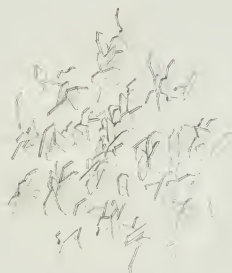
N°

PARIS.

---

*Guérin*  
Je te fais adresser  
mon bonjour et te prie  
de lui dire que  
je t'embrasse

quinidine





# Académie Nationale de Médecine.

Paris, le 2<sup>g</sup> 1852

MONSIEUR ET TRÈS-HONORÉ CONFRÈRE,

J'ai l'honneur de vous prévenir qu'il y aura assemblée

*De la Commission du Prix  
de l'Académie*

dans le local ordinaire des séances, rue des

Saints-Pères, 39, le *Vendredi* 5 de ce mois,

à 3 heures précises

*Pour statuer sur le Prix*

Vous êtes prié de vouloir bien vous y trouver.

Veillez, Monsieur et très-honoré Confrère,

agréer l'hommage de ma considération la plus distinguée,

*Le Secrétaire perpétuel,*

*Deb.*



Pour suite de l'extraordinaire sècheresse de l'été dernier,  
laquelle s'est prolongée à tout peuda près jusqu'à l'automne,  
les fièvres ont été très rares, et peu d'individus atteints de  
cette maladie ont été vus, contre l'ordinaire dans les hôpitaux  
de Rome. Cette heureuse et précieuse de fébricitante,  
n'a pas diminué, mais a retardé de quelques jours le nombre  
considérable de nos expériences publiques. Pendant l'été,  
et spécialement depuis la fin de Juin jusqu'au commencement  
d'Août, quatorze malades, tant hommes que femmes, ont été  
soumis à l'usage du nouveau quina. Leurs fièvres, quoique  
toutes manifestement périodiques et intermittentes, étaient  
de différents types, et diverges aussi pour la qualité et les  
circonstances. Il y en avait du type de tierce et du type  
de quarte; il y en avait aussi de penniculées, les penniculées  
ne manquaient pas, <sup>des écoulements</sup> y en avait eu deux cholériques, quelques-  
uns récemment développés, et d'autres invétérés, ce qui s'est  
reproduit à cette époque. Nous ne sommes jamais obligés, pour  
les dissiper, d'outrepasser la dose de deux onces et demie du  
nouveau quina, divisé en 6 petits saquets par once, et  
administré à des intervalles proportionnés, pendant <sup>les intervalles</sup> la cessation  
des accès. Dans une seule quarantaine, la dose fut portée à deux  
onces 3/8, sans jamais arriver dans aucun cas à 3 onces,  
puisque deux onces seulement ont été presque toujours suffisantes  
pour la guérison, et quelque fois encore moins. Deux seulement



de ces fièvres périodiques se manifesta pour la première fois  
dans les individus qui en étaient atteints, tandis que toutes les  
autres se reproduisaient dans des corps qu'elles avaient visités  
d'autre fois, ou dans la même année ou précédemment. La forme  
d'un lièvre et d'un nouveau quina furent employées avec  
succès dans la fièvre d'été, une dose plus considérable ayant  
été réservée pour parer pour l'automne, saison d'autant plus  
favorable à ces mêmes fièvres, qu'elle rend beaucoup plus graves  
et beaucoup plus obstinées, même au jugement du vulgaire. En  
conséquence, au commencement de novembre, nous en ~~recommençâmes~~  
recommençâmes aux mêmes expériences, cependant tout à mort, et jusqu'au  
milieu de décembre, nous traitâmes, avec le nouveau quina, les  
individus atteints de fièvres périodiques de différents types,  
quatre desquels étaient quartains, et presque toutes accompagnées  
d'obstruction <sup>du</sup> de foie et de la rate, effets accoutumés de ces  
répétées des mêmes fièvres, qui, accompagnées de ces éruptions,  
sont toujours plus tenaces et plus rebelles. Malgré cela, le nouveau  
quina étant administré de la même manière et aux mêmes doses,  
on a obtenu les mêmes heureux résultats, puis que, après avoir  
pris deux onces de cette écorce réduite en poudre fine, (quelque fois  
un peu plus et au si quelque fois moins) les divers symptômes  
fortement guéris des fièvres étiologiques, les uns un peu plus  
tôt, les autres un peu plus tard. Et si il y en eut qui restèrent  
quelque jour, de plus, au delà du répit, ce fut dans le

but de mieux observer les progrès de leur convalescence, et mieux  
s'assurer de leur guérison. Chacun connaît la ténacité des  
fièvres quartes, la difficulté ~~de débarrasser~~ de leur expulsion.  
Même j'ai vu des hontes de la médecine, puis qu'elle  
résistait souvent aux plus copieuses doses de l'écorce du Pérou,  
quoique fréquemment ~~on est obligé~~ on en est réduit à attendre leur  
fin, plutôt du changement de la saison, que du changement  
de la saison que des moyens médicaux. Or le cas de fièvre  
quarte se présente parmi les fièvres périodiques  
que nous avons combattues avec le nouveau quina; et quoique,  
selon l'ordinaire des fièvres quartes, elles fussent amplifiées  
de forte obstruction de rate, elles n'ont résisté, dans aucun  
cas, à la vertu fébrifuge du quina pitaya, ~~administré~~  
à des doses très modérées. En effet, <sup>étant</sup> administré ~~selon~~ + d'après  
notre méthode, par intervalles calculés, dans les jours d'accès,  
il n'a jamais été nécessaire d'arriver à la dose de trois onces:  
un peu plus d'une once modérée déjà le paroxysme, ou un  
peu plus de deux onces le faisait tout à fait disparaître. Ainsi,  
il suffirait ordinairement de 2 onces  $\frac{1}{2}$  pour le nouveau  
quina pour dissiper les plus tenaces de fièvres périodiques,  
tandis qu'il faut toujours plusieurs onces du quina ordinaire,  
comme cela est connu de tous les médecins, et souvent sans  
effet salutaire, bien que joint à d'autres médicaments, qu'on  
regarde comme d'utilité auxiliaires. Or cette dose <sup>modérée</sup> ~~inférieure~~

du Quina d'itaya, suffisante pour dissiper les fièvres les plus obstinées, comme les plus d'augures, forme la preuve la plus certaine de sa vertu supérieure, et de son efficacité antipéripélique, preuve qui vient s'ajouter à l'opinion qu'en ont les Américains eux-mêmes.

Mais si ce nouveau Quina était mis dans le Commerce, à acquiesce bientôt la réputation qu'il mérite, on aurait <sup>fort</sup> beaucoup à craindre des sophistications des commerçants, qui préfèrent leur intérêt à <sup>au bien</sup> l'utilité publique. Et leurs fraudes ne seraient guère toujours faciles à découvrir: et elle ont été pratiquées <sup>par</sup> beaucoup d'autres espèces de Quina, depuis leur apparition en Europe, on aurait d'autant plus de raison de leur redouter d'autre celle qui en est la plus efficace et la plus utile, et par la même le plus propre à tenter la cupidité des marchands. L'histoire nous apprend que les Athéniens avaient établi une magistrature particulière des Symphactes, qui veillait sur la culture, le commerce et l'exportation de figues (de l'attique) puis dans il était extrêmement ancien. Il semblait beaucoup plus raisonnable et plus juste que les anciens lois du Pérou et de la nouvelle Grenade établies une magistrature particulière chargée <sup>inspecteur des</sup> de veiller sur les arbres à quina, dont leur pays abonde. Il serait chargé de veiller sur la récolte, et sur les fractions de l'écorce des écorces, et de prévenir de toute espèce d'altération, et de fraude une ~~regot~~ production bien autrement précieuse et utile que les figues, puisqu'elle apporte le remède certain de la plus fréquente

maladie des hommes, de la fièvre périodique, quelque fois  
funeste, ou même mortelle, sous le nom de 'fièvre perniciieuse'. Il  
devrait aller de pair avec les règlements établis en Amérique,  
de mesures & correspondantes d'avec les ports de l'Europe, tendant  
à garantir de plus en plus la pureté des différents côtes de  
Quina

Venutty, très Unan-Enuice, accueilli avec votre bonté accoutumée  
 à teluigunge, quoique bien froide, de votre zèle, et de votre reconnaissance  
 faite bonne, ainsi que de votre récitation. L'auguez au fin-fais  
 même l'occasion de le déposer aux pieds de la sainteté, que ce  
 bel protégé a conserue longuement, pour le bien, de Rome et de  
 l'Eglise.

De Votre Em. révérendissime

Le très humble, très dévoué, et très obéissant serviteur

Joseph De Matthaeis

Professeur de Médecine Clinique à l'Univ. de Rome.

Lettre de Mr. Girolamo Corriès sur  
le Quina de Pitagò, à l'honorable Secrétaire d'Etat  
de l'Intérieur et des Affaires ~~extérieures~~ étrangères de la  
République de la nouvelle Grenade.

Traduction.

Lors que V. S. me fit l'honneur de me communiquer, pour  
les traduire, les observations relatives aux diverses applications  
thérapeutiques, et aux analyses chimiques qui ont été pratiquées à  
Bogotá par les illustres professeurs de Médecine et de Chimie, du  
Quina appelé de Pitagò, que le Gouvernement Suprême avait  
envoyé à la Société, et au vu de la célébrité bien méritée que  
depuis quelques années, cette précieuse source a acquise dans toute  
l'Amérique du Sud, et dans plusieurs contrées de l'Europe, par  
sa qualité fébrifuge, et son efficacité supérieure à celle des autres  
Quinas connus, je résolus de rectifier les opinions erronées  
que quelques savants se sont formées à son sujet, et de  
dissiper les doutes qui existent sur l'espèce botanique à la  
quelle il doit appartenir.

• Quoique j'eusse déjà depuis longtemps <sup>même</sup> examiné ce  
médicament naturel, qui végète dans une ample zone, sous  
la chaîne centrale de la Cordillère des Andes, à la température  
de 50° à 100 degrés (Fahrenheit), que l'on a pu déterminer

botaniquement, et que je ne doute pas qu'il s'y rapporte tout-à-fait à la tribu des Rubiacées, et au genre des *Psychotrias*; j'ai renouvelé mes observations pour décrire l'espèce avec plus de ponctualité et de certitude. À cet effet, j'ai obtenu de Mr. le Docteur Emmanuel Maria Mosquera, gouverneur actuel de la Province de Popoyan, un grand nombre de spécimens des fleurs, fruits et feuilles qu'il a personnellement recueillis, provenant de ses individus sur pied, existant sur le sol même du pays de Pitajo, où ils prospèrent le mieux. C'est à la vue des branches, les mieux conservées qu'a été exécutée, avec toute l'attention possible et l'exactitude nécessaire, le dessin que j'adresse à V. S., de ses feuilles, de ses fleurs et de sa fructification, dans leur dimension naturelle; et c'est sur ces mêmes sujets que j'ai rédigé la description qui suit, de ses caractères généraux et spécifiques.

+ l'extrémité Calice <sup>très</sup> ~~super.~~ persistant. Corolle monopétale, à sa base, limbe formé de cinq lanières décussées jusqu'à l'insertion des étamines. Étamines filamenteuses, au nombre de cinq, renfermées et insérées dans l'intérieur du tube de la corolle. <sup>anthères</sup> ~~capitules~~ oblongues et flottantes. Pistil avec ovaire inférieur, style simple, et stigmat bifide. ~~Receptacle~~ <sup>ovaire</sup> ~~capitule~~ polygyné, de deux cellules ou loges, dont la déchirure ou l'ouverture est valvulaire <sup>et</sup> septuade. Séminence avec des ailes membraneuses, sur le bord, marquées de ~~points~~ disposées en deux séries





5°. On se défie un peu de la quinine et de la cinchonine, et  
a seulement un nouvel alcaloïde, qu'a ~~et~~ déjà observé sur  
celui nommé à Rome le Professeur Peretti, qui <sup>annonce</sup> ~~ajoute~~ que l'autre  
possède les mêmes alcaloïdes en plus grande abondance que  
tous les autres. Quinins officinaux analysés jusqu'à présent.  
J'ajouterais que l'un comme l'autre de Quinins de Pitagò  
possède les mêmes qualités officinales: ils sont tous deux  
éminemment fébrifuges, toniques, etc., et il s'en fait  
indistinctement, en médecine, toutes les applications habituelles,  
avec un égal succès; mais jusqu'à présent on ne reconnaît ni  
à la structure des arbres, ni à leur <sup>différence</sup> ~~caractère~~, quels sont les  
individus, et au les écarts des quels existe cette différence, <sup>comme</sup> ~~comme~~  
seulement par l'analyse chimique. En fin les arbres de l'un  
et de l'autre Quinins de Pitagò ont de quarante à cinquante  
pieds de hauteur et de 16 à 20 pouces de grosseur: ils se  
ressemblent à leur aspect extérieur, et quant à leurs feuilles,  
qui quelque fois sont lancoles, d'autres, oblongues, d'autres  
cordiformes, à l'endroit où se terminent les branches florifères.  
leur longueur ordinaire est de 3 à 4 pouces, et leur largeur  
est de moitié d'au les individus qui ont toute leur croissance;  
mais les feuilles des jeunes plantes ont régulièrement le  
double de ces dimensions. Il n'existe pas non plus la moindre  
différence d'autre aucun des organes de sa florification, qui  
est absolument identique. Pourquoi on puisse rejeter les expériences

officinales et les analyser chimiquement, j'ai fait recueillir, par  
cajete d'écorce de Quina de Pitayé avec toutes les précautions  
que l'expérience a démontré être nécessaires pour l'obtention  
de bonne qualité.

D'après ce qui vient d'être établi, j'ose <sup>par</sup> seules qu'il existe  
de motifs de douter que le Quina Pitayé soit un vrai  
Cinchona officinale. L'inspection seule de la fleur, et la  
disposition de ses organes sexuels, l'examen du genre  
Erechtina de Mr. le Docteur de Caudolle, au quel genre  
on se fût qu'il pourrait appartenir. M. Mr. Orera et Guibon  
encore moins le Quina Pitayé serait-il le Piton de Ste Lucie

cette assertion est  
compètement erronée  
dit M. Botka qui  
a prouvé cela

comme la ~~crue~~ <sup>crue</sup> le ~~seigneur~~ <sup>seigneur</sup>, sur la seule ressemblance des motifs,  
sans passer à l'énorme distance, à la différence de la latitude,  
d'élévation et de température qui existe entre les pays et  
les contrées natales de l'un et de l'autre Quina. Il ne  
peut pas non plus se confondre avec le Quina de Ruiz et  
de Pavon, seulement parce que le Quina de Pitayé régit croît  
dans une des branches de l'Ande de la nouvelle Grenade,  
comme l'autre dans les Andes du Pérou, mais à la distance  
immense de plusieurs centaines de lieues. Le Quina  
de Pitayé paraîtrait plutôt être celui dont parle Mr.  
Berzelius, Tome 6, page 225, analysé par Mr. Kuhlmann,  
qui y a trouvé la quinine et la cinchonine; comme aussi il peut  
être le Quina nouveau dont parle le même Mr. Berzelius.

à la page 222 du même volume, analyse par M. le Colléti  
et Caverton, qui marque des deux alcaloïdes, or, comme on la  
dit, les Quinas de Pitajo ~~les uns possèdent un alcaloïde,~~  
~~et les autres non,~~ et l'un possède un alcaloïde, et l'autre non,  
quoique tous deux appartiennent indubitablement au genre  
Cinchona, et que l'action tonique que l'un et l'autre exerce  
sur l'économie animale, et dans les maladies intermittentes, soit  
également énergique. N'est-ce pas qu'avec tous deux on  
obtient constamment un succès favorable dans les fièvres intermittentes  
rébelles, qui ont résisté plus d'une fois à l'écorce du Pérou,  
et même au sulfate de quinine par exaltation. Dans  
les intermittentes pernicieuses appelées Larveas, le Quina de  
Pitajo est, chez nous, le moyen presque unique de sauver la  
vie du malade. Il s'administre aussi avec grand succès dans  
les fièvres nerveuses périodiques. Comme tonique, on le préfère  
actuellement dans les affections adynamiques, le gauchissement,  
dans les ~~ou~~ hémorragies avec faiblesse, etc, etc. On  
pourrait enfin considérer plutôt le Quina de Pitajo comme  
de variété plus énergique du Cinchona laucifolia de  
Kuntz, appelé timite, à cause de la grande ressemblance qui  
existe entre eux.

Mais quoique le Quina de bonne qualité comme celui de  
Pitajo, soit un des spécifiques si peu nombreux connus en médecine,  
et bien que les Professeurs s'appliquent à propos et avec discernement

dans les cas où il convient, on n'obtiendra pas le suc de Quina  
et si on ne l'a pas recueilli et conservé avec les précautions  
que l'expérience a indiquées comme nécessaires pour en éviter l'alté-  
ration, bien que de qualité supérieure, perd son efficacité  
si, après avoir été extrait de l'arbre, les écorces restées  
exposées pour quelque temps au soleil et à l'air. Et l'autre  
raison, si également, si, au plutôt après l'extraction, les é-  
corces ~~restées~~ <sup>restées</sup> au mouleau, ou restées amoncelées pendant long-  
temps, quoique ce soit à l'ombre, et si, tout en ayant eu soin de  
les étendre pour les faire sécher, on les laisse dans un col-  
umière, et dans un lieu sans courant d'air. De plus les  
écorces de quina convenablement séchées, perdent de leur qualité  
si les cuisses dans lesquelles elles se trouvent déposées n'ont  
pas été soigneusement lavées et non par faitement séchées avant

Ces différentes observations je pense, pour  
dissiper l'incertitude qui a régné jusqu'au jour d'hui en Europe  
sur la véritable espèce botanique à laquelle appartient le Quina  
de Pérou, et il n'y aura plus de motif de douter que, tant celui  
qui possède la quina, que celui qui en étant privé, passe offre  
un nouvel alcaloïde, ~~ne soit~~ ne soient de genre Cinchona.  
Les applications nombreuses qui, depuis nombre d'années, leur  
sont faites, avec succès dans l'Amérique du Sud; celle qui en  
déjà été pratiquée en Europe, et celle qui pourront maintenant se  
répéter à Rome avec la quina que j'envoie, confirmeront

72  
la juste et légitime, et a surtout à la bonne le prendre à présent  
article de Commerce, qui en certaine façon lui est exclusif à  
cause des qualités éminentes de cette écorce. Mais ce serait peu  
pour la République que sa réputation s'établisse dans les marchés  
d'Europe, si le Gouvernement l'a abandonné à la cupidité des  
spéculateurs, puis qu'il ne manquerait pas de tomber en défiance,  
au bout de peu de temps, comme il est arrivé à la tunisie de  
Moutiz, et comme on remarque qu'il arrive aussi au sulfate de  
Quina de France, à cause de ses diverses falsifications. Le préjudice  
de ce fraudeur ne retombe pas ordinairement sur les premiers  
inspecteurs de la bonne foi publique, qui au contraire ont lieu tout  
le profit qu'ils attendaient, mais bien sur les autres particuliers qui  
se trouvent par là injustement privés des avantages ultérieurs de  
la spéculation. Ne doit-on donc dans les attributions du Gouvernement  
de prévenir de tels abus, de mettre à la prospérité du  
Commerce, source de richesse pour cet Etat.

Et si V. S. pensait que ces observations multipliées le  
sont proposées, ce serait contribuer à empêcher les fraudeurs de  
quede transmettre ce Mémoire, par le canal du chargé d'affaires  
près de la sainteté, aux Professeurs qui se sont occupés à  
Rome de l'application, et de l'analyse du Quina de Pérago.

Dieu garde V. S.

Girolamo Corred.